



# PROCEEDINGS FROM THE ETS & ARI EMOTIONAL INTELLIGENCE WORKSHOP

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Volume III  
Session V and Appendix

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**Proceedings from the ETS & ARI Emotional Intelligence Workshop**  
Session V: Applications

**VOLUME III**

# Proceedings from the ETS & ARI Emotional Intelligence Workshop

Session V: Applications

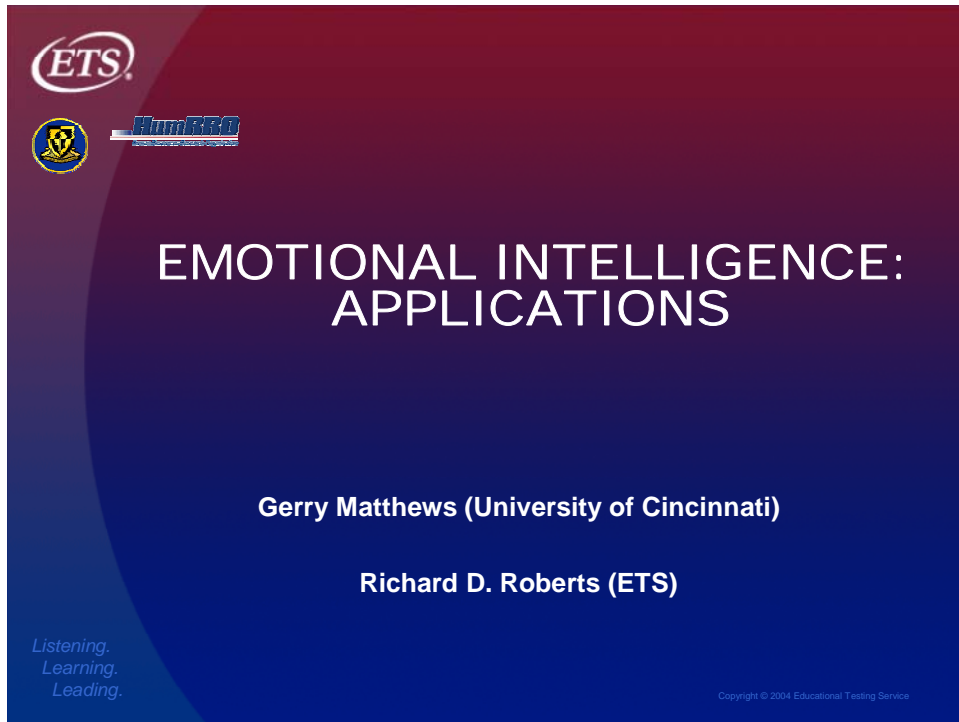
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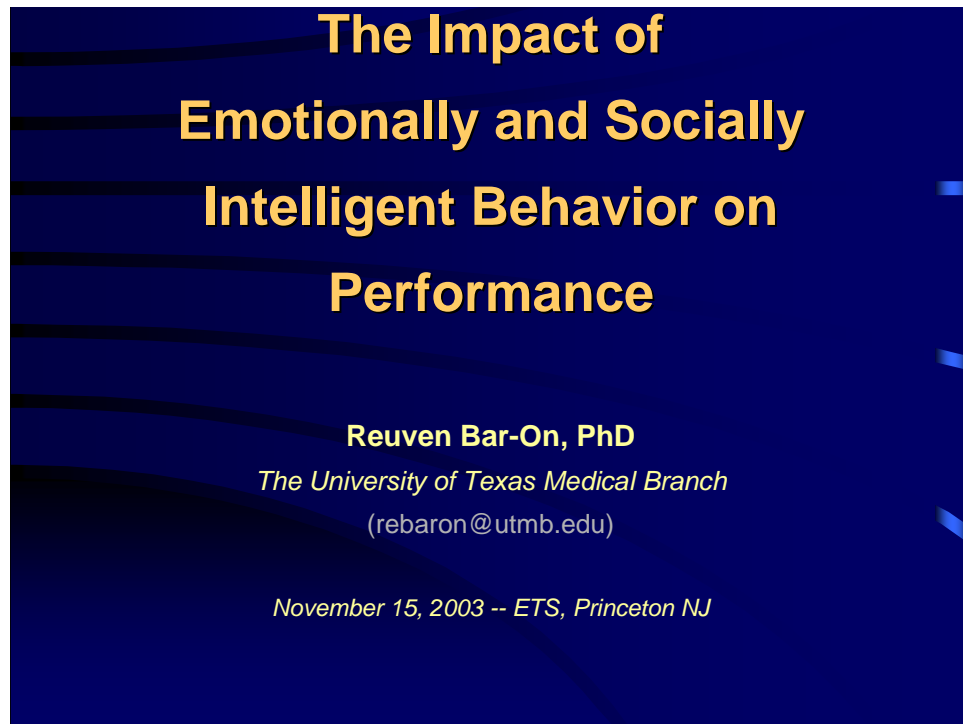
# **Proceedings from the ETS & ARI Emotional Intelligence Workshop**

Session V: Applications

## **SESSION III: APPLICATIONS**



**DR. ROBERTS:** I'm actually co-chairing this session today with Gerry Matthews. And we're going to have a session that's dear to my heart, because one of the things that I got to know about psychology when I was undergraduate, is that it's great to do basic research, but always felt there had to be more. And nowadays, I think, more so than ever in the past, there's an issue of accountability. What are the applications of your given theories? And so today, that's what we're going to look at: what are the applications of some of the ideas that have been thrown around earlier? So it gives me great pleasure to introduce Reuven Bar-On, who will present "The Impact of Emotionally and Socially Intelligent Behavior on Performance."



## **EMOTIONALLY AND SOCIALLY INTELLIGENT BEHAVIOR ON PERFORMANCE**

**DR. BAR-ON:** Good morning. It's a pleasure to be here, and I would like to say that I'm really enjoying the conference. The level of the discussions is superb. What I will be speaking about today is the EQ-i, how it was developed, how it was normed, its psychometric properties, and how it's been applied. You've had, so far, discussions about multi-raters and ability tests, and this presentation will discuss one of the major self-report measures of EI. What we'll do is try to integrate what has been done to date, how the EQ-i has been used, and how it can be used in the future.

## Defining “Emotional Intelligence”:

- There is no *ONE* way of defining this construct.
- There are a number of definitions to choose from.
- According to the *Encyclopedia of Applied Psychology* (in press), there are three major EI models:

*The Salovey-Mayer Model*

*The Goleman Model*

*The Bar-On Model*

I'd like to begin by defining emotional intelligence as I view this construct, and of course I understand that everyone has their preferred definition of EI. And the definition I will give you now is a definition that I've been working on for a number of years which has been fine tuned by research findings. Yesterday, Jack Mayer told you about a revision in their theory from 1990 until 1997. After 1997, it was a slightly different theory. And the same has happened here with my definition of this construct. But these definitions and revisions of the definitions are not based on supposition and unfounded theorizing, or suggesting that “this is the way I think it should be.” These definitions and revisions are based on research. I would also like to begin by saying there isn't one way of defining emotional intelligence, like there is not one way of describing personality or cognitive intelligence. We've heard so far a few basic approaches to this during this conference, and there are certainly a number of definitions to choose from.

According to the *Encyclopedia of Applied Psychology*, there are three major EI models today. It's not saying that these are *the* models or the only models. These are the Salovey-Mayer model, the Goleman model and the Bar-On model, and I will discuss the last model. This is what it looks like after about 23 years.

## The Bar-On model of

### Emotional and Social Competence

*Emotional and social competence* is based on an array of emotional and social competencies that determine how well we understand and express ourselves, understand and relate with others, and cope with daily demands.

You'll notice that I refer to "competencies", and I'll relate to this question of why I tend to refer to this construct as "competence" rather than "intelligence". This question arose the other day in one of the presentations. There's a good reason for this, but I'd rather spend more time on the presentation itself at the present and get to this particular issue at the end of the presentation if someone is interested. You will also note that I refer to this construct as "emotional and social competence", because it's very difficult to separate emotional competence from social competence based on statistical as well as neurological findings as I will explain later. Emotional and social competence is based on an array of emotional and social competencies that determine how well we understand and express ourselves, understand and relate with others, and cope with daily demands.

I was influenced by a number of researchers and theorists. I would say that the forerunners and the roots of this particular definition of emotional intelligence begin with Charles Darwin. Emotional and social competence is what we need to adapt, survive and, perhaps, thrive. Quite often, people have the idea that emotional intelligence miraculously surfaced in October or November of 1995, upon the publication of *Emotional Intelligence* by Daniel Goleman, which is really not the case. This construct has been around for a long time although the name, the terms, the definitions and conceptualizations have changed. But the construct itself has been studied from approximately 1837, when Darwin began to study the role of emotional recognition and expression in survival and adaptation, which culminated in the first scientific publication on this topic in 1872.

## The Bar-On model of

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*Emotional and social competence* is based on an array of emotional and social competencies that determine how well we understand and express ourselves, understand and relate with others, and cope with daily demands.

Sometimes, I think we're a bit pompous when we claim that, during the last ten years, we are the people who have been driving the scientific edge of emotional intelligence. It's simply not true. The first scientific work was carried out by Darwin. And from Thorndike in early part of the twentieth century to the present, various aspects of this construct have been scientifically studied by a very large number of people. A recent computerized search revealed that from 1970 to 2000 alone, there have been approximately 3,000 scientific publications on this wider construct of emotional and social competence, emotional intelligence or however you want to refer to it. A third of those scientific publications have been on alexithymia alone, which I consider to represent the pathological end of the EI continuum.

**Most definitions of “EI” comprise at least one of the following clusters of emotional and social competencies**

[all of which are included in the Bar-On Model]:

- The ability to understand and express one’s feelings
- The ability to understand others and to relate with them
- The ability to manage and control emotions
- The ability to manage change and solve problems of a personal and interpersonal nature
- The ability to generate positive mood and be self-motivated

*(a facilitator rather than a component of EI)*

Most definitions of emotional intelligence, and of this wider construct, put forth during the twentieth century comprise at least one of the following clusters of emotional and social competence, all of which are included in the Bar-On model. Basically it looks like this. One cluster is the ability to understand one’s emotions and express feelings. The second major cluster that appears in many EI definitions is the ability to understand others and relate with them, to understand how people feel, how they express themselves, and based on this information, to relate with them cooperatively. And the third major component is the ability to manage and control emotions, so that they work for us and not against us. The fourth major component that appears in some EI definitions is the ability to manage change and solve problems of a personal-interpersonal nature. This is often called “social problem solving”. Those who are involved in educating or enhancing the emotional intelligence competencies often focus on this fourth component, and this fourth component takes information from the first two. In order to solve problems of an interpersonal nature, I need information about myself, my feelings, emotions, and about other people and understanding the way they feel and why. The fifth component is not really an integral component of this construct. It’s more of a *facilitator* of emotionally and socially intelligent behavior. It’s the ability to generate positive affect and to be self-motivated. Quite often, this aspect of EI finds its way into modern definitions of this construct.

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- The ability to generate positive mood and be self-motivated

*(a facilitator rather than a component of EI)*

Regarding this fifth component of the Bar-On model, I once again stress that it is a facilitator rather than an integral part of EI. This is based on my examination of the normative sample used in the development of the EQ-i, which we'll talk about in a second. I looked at the results of the factor analysis of that sample going from exploratory to second-order confirmatory factor analysis. Based on a representative population sample of 16 to 80 year olds, including approximately 4,000 people fairly evenly divided between males and females, I came up with these five meta-factors. These factors comprise 15 subfactors. Now, when we factor analyzed the youth version of the EQ-i which was normed on nearly 10,000 youth from 6 to 18, including a representative sample of the population in the United States and Canada, we found that these five meta-factors break down into four major factors. The fifth meta-factor simply disappeared with parts of it loading on the other four factors.

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[all of which are included in the Bar-On Model]:

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*(a facilitator rather than a component of EI)*

When we look at children, it comes down to the first four major factors listed on the slide. Once again, the last or fifth one just dissolves, which I was happy about because I think that the first four are the essential components of EI. Regarding the first major component of this model, some definitions will split it into the ability to be aware of emotions and the ability to express them, while the second component is often split, in some definitions into the ability to understand emotions in others and the ability to relate with people. However, based on what we have received, we come up with this four- and five-factor structure for children and adults respectively. When we begin to limit the output of factors and we start limiting to three, we come up with an intrapersonal factor, an interpersonal factor, and a third factor that combines the ability to manage emotions and the ability to manage change. When we limit the output to two factors, we come up with an interpersonal factor and an intrapersonal factor, and the other components load on the latter. This is interesting, because it resembles Howard Gardner's conceptualization of “personal intelligences” which comprise “intrapersonal intelligence” and “interpersonal intelligence”.

## Measuring “Emotional Intelligence”:

Once again...

- There is no **ONE** way of measuring this construct.
- There are a number of measures to choose from.
- The Encyclopedia of Applied Psychology suggests that there are three major EI measures:

The MSCEIT

The ECI

The EQ-i

Once again, in measuring emotional intelligence, there's not one way or one approach. In the conference and elsewhere, it has been argued that if EI is an ability like cognitive intelligence, it must be tested with an abilities test. However, I am not sure about this, because emotional intelligence is not like cognitive intelligence to begin with. Moreover, look at how the DSM-IV recommends arriving at a diagnosis of mental retardation (deficient cognitive intelligence). It is not recommended to arrive at a diagnosis of mental retardation based solely on IQ scores (based on ability tests), but by collecting additional information. This includes interviewing the individual and significant others regarding his or her daily behavior, what they can and cannot do and how well. Essentially, this additional information is based on a self-report as the person is describing his or her particular performance on a daily level. Hopefully, we will eventually use a similar approach in assessing EI – a combination of ability testing, self-report, and observation.

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The MSCEIT

The ECI

The EQ-i

So, I think there are many factors to consider, several possibilities, a number of assessment modalities that can be brought into play here. There are a number of measures to choose from, and once again the *Encyclopedia of Applied Psychology* suggests that there are three major EI measures today – the MSCEIT, which we heard about yesterday; the ECI, which is a multi-rater based on Goleman's model; and the EQ-i, which is based on my model of emotional and social competence. Based on my background as a clinical psychologist, if you really wanted to receive a great deal of information about one's emotional and social intelligence, you would have to use a *battery* of EI measures based on different assessment modalities to gain a panoramic view of the individual's ability, daily behavior, and actual performance.

## Development of the EQ-i:

- Development of a *theory* of human effectiveness (1980)
- Construction of an *inventory* to examine the theory (1983)
- Data collection and validation across cultures (from 1984)
- The 1<sup>st</sup> “EI measure” to be published by test publisher (1996)
- The 1<sup>st</sup> “EI measure” to be reviewed in the  
*Buros Mental Measurement Yearbook* (1999)
- Oxford Univ. selected the Youth Version from 59 tests (2002)
- The most widely used EI measure (2002, > 1 ML assessments)

The development of the EQ-i – I’ll just give you a very quick review of the major milestones related to the development of the EQ-i. I began developing this theory as a clinical psychologist. Every one of the EI theorists behind these three major models came from different perspectives. And my particular perspective is from clinical psychology, and it began when I was assessing and treating people who presented with various problems of one sort or another. And my thinking at the time was that maybe the world is divided into those people who can cope very well emotionally and socially and those who have a great deal of difficulty in this regard. So the idea began out of that particular perspective as a clinical psychologist, and I began a long process of interviewing colleagues who were psychiatrists, psychologists, and social workers, regarding what they look at, what they assess and what they attempt to treat to get an idea of what emotional and social functioning and effectiveness might be involved. Then, I went into the literature and began to create clusters of emotional and social competencies and skills and examples of effective behavior. This was the beginning of firming up a theory of effective emotional and social functioning that would hopefully say something about emotional and social competence.

I then developed an inventory to test this theory that was emerging, which was one way of doing it. I planned then to apply statistics and mathematical models to find out how this model holds up geometrically after examining it with factor analysis for example. I began to translate the EQ-i, the first version of the inventory, into a number of languages so I could examine the model in different countries around the world to see if a similar model was appearing.

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Today it's translated into something like 30 languages, and I began to collect data from all over the world. This started in about 1984. The EQ-i was eventually published as the first commercially available “test of emotional intelligence” by a psychological test publisher in 1996. I, personally, would prefer to refer to it as a measure of emotionally and socially intelligent behavior rather than a test of emotional intelligence. The EQ-i and its youth version (the EQ-i:YV) were the first and only EI tests to be peer-reviewed in the *Buros Mental Measurement Yearbook* to date. There are, the last time I checked, three other tests of emotional intelligence that are listed in Buros, but the EQ-i and the youth version of the EQ-i are the only ones that had been peer-reviewed. It is also interesting to note that a team of psychometricians from the University of Oxford were commissioned by the British Department of Education and Skills in 2001 to recommend a measure of emotional and social competence for use in schools nationwide in the UK; after reviewing 59 such measures, they recommended the use of the youth version of the EQ-i for 7 to 12 year olds in British primary schools. The EQ-i is the most widely used EI measure in the world today.

### **Description of the EQ-i:**

- **133 brief items** (normed on close to 4,000 adults)
- **5-point response set** (*True to Not True of Me*)
- **Mean = 100, SD = 15** (like IQ)
- **Total EQ score** (an overall indication of one's EI)
- **5 composite scale scores** (tapping 5 major areas)
- **15 sub-scale scores** (tapping 15 EI competencies)
- **4 validity indicators** (with a correction factor)
- **Administration time ~ 40 minutes**

I will go over the description of the EQ-i very quickly. There are 133 brief items. It was normed on nearly 4,000 individuals from 16 to 80 years of age in North America. I started out with over 1,000 items that I originally selected. I gave brief definitions of the areas of emotional and social competence I was developing at the time to psychiatrists, psychologists, and social workers and requested the following: "If you were interviewing someone and wanted to know the extent to which that person possesses the following emotional and social competencies based on the definitions given you, what questions would you ask?" In addition to this approach, I went back to the literature to see if there were indications for creating additional items based on studies related to emotional and social competence that appeared in the literature. I thus started out with about 1,000 items. I began by reducing redundant or nearly identical items, and then began the long process of testing large population samples around the world.

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And then based on the combination of item analysis and factor analysis, I narrowed the item pool down to 133 items after more than a decade. There's a short version of the EQ-i based on 51 items. I prefer the long version, because it renders more information and possesses stronger psychometric properties. The EQ-i has a five point response set going from "not true of me" (1) to "true of me" (5). The raw scores are converted into standard scores. The mean is set at 100 with standard deviations at 15. As a clinical psychologist and a supervisor of clinical psychologists, I wanted something that was tangible, similar to a full IQ score, a verbal and a performance score. When I began to think about this approach, I wanted something that would look like an IQ test that would give information about the person's emotional social functioning. I wanted an "EQ" score comprising subscores similar to the WAIS, which is the primary reason why I coined the term. The EQ-i gives a total EQ score as an overall indication of emotional and social competence. It's a very general score however. This is broken down into five composite scores that tap the five areas that we had on the previous slide and then it renders 15 sub-factors of various emotional social competencies that the test taps.

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- **4 validity indicators** (with a correction factor)
- **Administration time ~ 40 minutes**

And it has four validity indicators, two of which tap positive impression and negative impression making. And based on scores from these two scales, there's a correction factor that readjusts the scores on the other scales to reduce the potential for response bias. If one is applying a self-report test without an indication of faking good and faking bad, it's rather easy for many respondents to fake good or bad at least to some degree. So, based on scores obtained on the positive impression and negative impression scales, that measure attempts to present oneself in a more positive light or negative light, there's a correction factor that reduces it this potential for response bias. It deflates or inflates the scale similar to the K Scale on the MMPI. The administration time is approximately 40 minutes.

## EQ-i Internal Consistency and Retest Reliability at 2 Weeks and 3 Months

[Bar-On, 1997, n=3831 US/CA; Derksen et al. 2002, n=100 NL; Dayan: n=40 IL]

EQ-i	Consist	Retest	EQ-i	Consist	Retest
SR	.89	.85 → .61	ST	.84	.83 → .67
ES	.80	.78 → .71	IC	.79	.84 → .60
AS	.81	.81 → .69	RT	.75	.83 → .56
IN	.79	.81 → .63	FL	.77	.68 → .75
SA	.80	.68 → .54	PS	.80	.71 → .65
EM	.75	.74 → .54	OP	.82	.70 → .72
RE	.70	.80 → .48	HA	.81	.84 → .58
IR	.77	.81 → .50			

This slide shows the general internal consistency and retest reliability at two weeks and three months. For those who are interested in the sources, I'll provide this information at the end of the presentation, later during the conference, or by email. This is what it looks like. You have a handout on the desk to make it fairly easy to go through this rather than putting the long names for the 15 subscales on the slide. It would take up more than one slide, so I tried to make it as compact as possible and include as much information on one slide as possible in the same order as these subscales appears on the handout. SR is self-regard, ES is emotional self-awareness, and so forth. So in the first column, we have internal consistency, and in the second column is retest reliability from two weeks on the left side of the arrow to three months on the right side of the arrow. The lowest internal consistency coefficient is .70, the highest is .89. It holds up very well after two weeks – which is a rather short period of time for retest examination – and even after three months, the stability coefficients are still relatively stable. We have also information at one month, four months and six months, for those who are interested. So, this is an indication of how reliable, how consistent and stable these scales are.

## A Summary of Construct Validity Studies Conducted on the EQ-i Based

External Measure	Validity Coefficient
<i>Emotional Stroop Task</i>	+.36
<i>MSC Emotional Intelligence Test</i>	+.46
<i>Emotional Quotient 360</i>	+.69
<i>Structured Interview for Alexithymia</i>	-.44
<i>Trait Meta Mood Scale</i>	+.58
<i>Emotional Intelligence Questionnaire</i>	+.63
<i>Emotional Intelligence Scale</i>	+.66
<i>Toronto Alexithymia Scale</i>	-.72

This is a brief summary of the major validity studies that have been conducted to date looking at the construct validity of the EQ-i. Before we look at the summarized results regarding the construct validity of the EQ-i, a legitimate question that arises for EI test users is: Do I use an abilities test, a self-report, a multi-rater or a combination of two or three, and how do I make that decision? As a sophisticated test user, you would, of course, look at the psychometric properties of those tests, and you'd go for the test with the strongest psychometric properties. Whether one chooses a self-report, a multi-rater and/or an ability EI measure, one of the most important ways of making the best decision is to first choose the test with the best construct validity irrespective of its assessment modality. Construct validity is extremely important in order to know if the test in question is actually testing emotional intelligence. That's the big question. That was the question I wanted to ask yesterday during Jack's presentation. How do we know that this test or another test is testing emotional intelligence and to what extent? After getting a good idea regarding the construct validity of an EI test (or any test for that matter), we need to know what exactly does that test predict and how well. Poor construct validity and poor predictive validity render a test useless, irrespective of how much one prefers one assessment modality over another. So, here we are looking at a summary of the EQ-i's construct validity, based on studies that have correlated this instrument with various other EI tests and using a number of assessment modalities.

## A Summary of Construct Validity Studies Conducted on the EQ-i Based

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<i>Emotional Stroop Task</i>	+.36
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<i>Emotional Intelligence Questionnaire</i>	+.63
<i>Emotional Intelligence Scale</i>	+.66
<i>Toronto Alexithymia Scale</i>	-.72

The first test we are looking at on the slide represents more of a visual registration and/or recognition of emotions, called the emotional stroop task. It has a .36 correlation. Then, the next is an abilities test, the MSCEIT with a .46 correlation. And the next is a correlation based on a multi-rater which I developed called the EQ-360 based on my model, and the overall correlation is .69. This is followed by the correlation between the EQ-i and a structured interview, called the structured interview for alexithymia or SIFA; and alexithymia represent the pathological end of the EI continuum in my view (the inability to recognize, understand and differentiate between emotions). Forget about the name "alexithymia" which literally means without a name for emotions. Call it "lexithymia" meaning with a name for emotions – it's unimportant. It's more important what this construct represents. Here, the correlation is .44. The Trait Meta-Mood Scale was developed by Salovey and Mayer in the early 1990s and it is a self-report measure of emotional intelligence. The correlation between the TMMS and the EQ-i is .58 which is much higher than the correlation between it and the MSCEIT, both of which were developed by the same authors to measure EI.

## A Summary of Construct Validity Studies Conducted on the EQ-i Based

External Measure	Validity Coefficient
<i>Emotional Stroop Task</i>	+.36
<i>MSC Emotional Intelligence Test</i>	+.46
<i>Emotional Quotient 360</i>	+.69
<i>Structured Interview for Alexithymia</i>	-.44
<i>Trait Meta Mood Scale</i>	+.58
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<i>Emotional Intelligence Scale</i>	+.66
<i>Toronto Alexithymia Scale</i>	-.72

Then you'll see there are two other tests of emotional intelligence which were correlated with the EQ-i, the EIQ, and the EIS. Both correlations are high. The correlation between the EQ-i and the Toronto Alexithymia Scale, proved to be the highest -- it's minus .72, which is very high. And it's very interesting because the TAS-20 focuses only on three key aspects of EI factors, from the pathological end of the EI continuum as was previously mentioned. Only three factors are assessed, which represents only one component of the EQ-i (emotional self-awareness). So, as you go from test modality to test modality, you'll see that when you correlate other external EI tests with the EQ-i, the self-report measures, render the highest correlations which was expected. Therefore, my question is very simple. If I see correlations like these, which are fairly strong, this means to me that the EQ-i is sharing a very similar domain or the same domain with these other tests. This means that it must be measuring something or some things that are related to various aspects of emotional intelligence. This is the type of information that you should receive on the other EI measures before deciding what you would like to use to assess this construct. And, hopefully, other EI test authors will make this important information readily available. The question is not whether the EQ-i is a self-report, multi-rater or an ability test of EI based on this or that model of EI. The question is whether it provides reliable and valid information about EI?

## A Summary of Construct Validity Studies Conducted on the EQ-i Based

External Measure	Validity Coefficient
<i>Emotional Stroop Task</i>	+.36
<i>MSC Emotional Intelligence Test</i>	+.46
<i>Emotional Quotient 360</i>	+.69
<i>Structured Interview for Alexithymia</i>	-.44
<i>Trait Meta Mood Scale</i>	+.58
<i>Emotional Intelligence Questionnaire</i>	+.63
<i>Emotional Intelligence Scale</i>	+.66
<i>Toronto Alexithymia Scale</i>	-.72

When you use a self-report EI measure, you're essentially asking a person to describe their emotional intelligence, and one of the big questions is what if that person is not that emotionally intelligent which means, by definition, that they most likely have poor emotional self-awareness. If this is the case, it is logical to ask if self-report measures are valid measures of this construct. I've thought of two ways of trying to address this problem.

## Correlation between EQ-i Scores and Ratings of the 15 Competencies by Significant Others

[Bar-On, 2003; n=185, US]

EQ-i	Ratings	EQ-i	Ratings
SR	.62	ST	.69
ES	.33	IC	.55
AS	.41	RT	.43
IN	.43	FL	.47
SA	.56	PS	.52
EM	.46	OP	.78
RE	.50	HA	.65
IR	.55	<b>Total EQ</b>	<b>.69</b>

The first way is to compare external ratings of these 15 EI factors for individuals who have also taken the EQ-i. And we compared the behavioral ratings for 185 people who also completed the EQ-i. These ratings were made by two to three significant others – friends and/or family members who knew these people well – to see what sort of correlations we would receive between the two assessment modalities which focus on the same specific aspects of EI. And this is what we get.

Generally, they're fairly good observer rating correlations with the EQ-i. In other words, the way the person portrays himself or herself, the way they answer these 133 items is generally the way other people see them. This, therefore, adds to the convergent construct validity of the EQ-i. It's not a question of a self-report versus an ability measure. It's a question of what type of self-report measure, of how that self-report measures what it was designed to measure, and what other psychometric properties it has. The lowest correlation, which is very understandable, is emotional self-awareness which is .33 as you can see. It's very difficult to see if the person you are assessing has good or poor emotional self-awareness based on their behavior. This is a very difficult competency to measure on self-reports as well as multi-raters. Hopefully, ability-based tests can obtain more information in the area of emotional self-awareness.

For the most part, the overall correlation is .69 as was previously noted. So, this provides fairly good verification of how well the respondents are describing themselves in these various areas of EI.

**EQ-i Scores for Pts. with VM Prefrontal, Rt.  
SS/Insular & Rt. Amygdaloid Lesions  
Compared with a Control Group**

[Bar-On, et al., 2003; n=23, US]

EQ-i Scale	Control	VM/SS/AM	Z-value	p-level
Total EQ	101	82	3.33	.001
IntraPerson.	100	82	3.23	.001
InterPerson.	100	92	1.36	.175
Stress Man.	105	89	2.62	.009
Adaptability	100	86	2.28	.023
Gen. Mood	100	83	3.27	.001

Another way of addressing the potential problem of how an individual with low EI (including low emotional self-awareness) can describe their own EI is by looking at some interesting findings from a recent neurological study. , There are actually two reasons why I want to show this slide. The first is that this sheds additional light on the validity of this particular self-report measure. Working with Damasio's group at the University of Iowa, we looked at 23 patients with brain damage. Twelve of them had brain damage along a specific neural circuitry that governs emotional experience and processing which we now know overlaps with key EI competencies. Part of this circuitry includes the ventromedial prefrontal cortex that Richard Lane talked about yesterday. He picked up activity with a PET scan in this particular area while his subjects were involved in exercises related to emotional self-awareness. We looked at people who had lesions in this specific area of the brain together with the right insular and somatosensory cortex and the amygdala. And what we found was that people with this specific type of brain damage had significantly lower scores on the EQ-i when compared with a control group of 11 patients with brain damage outside of this specific circuitry in spite of normal cognitive intelligence.

**EQ-i Scores for Pts. with VM Prefrontal, Rt.  
SS/Insular & Rt. Amygdaloid Lesions  
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[Bar-On, et al., 2003; n=23, US]

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Adaptability	100	86	2.28	.023
Gen. Mood	100	83	3.27	.001

The reason for doing this study was not to validate the EQ-i per se, but was to see if people with damage along this circuitry have different responses on this self-report measure of emotional and social intelligence than patients with brain damage outside of the target area. An important byproduct of this piece of research was that it provided very interesting and valuable information. People with ventromedial prefrontal damage have great difficulty accurately describing themselves. When you ask them how they feel after suffering brain injury, they typically say that everything is fine being totally oblivious to their situation. The ability to look inward, (self-awareness) is one of the areas that are very limited after this type of brain damage.

**EQ-i Scores for Pts. with VM Prefrontal, Rt. SS/Insular & Rt. Amygdaloid Lesions Compared with a Control Group**

[Bar-On, et al., 2003; n=23, US]

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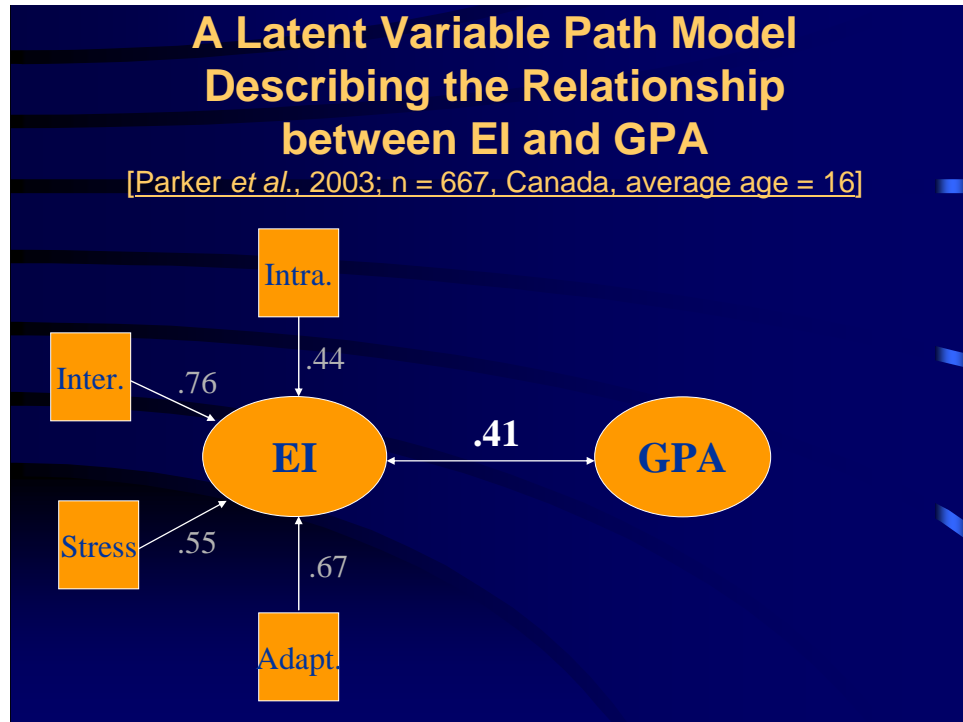
So what we have here are the results from this study. The control group is comprised of the people with damage outside this particular circuitry. We previously said that raw scores are converted to standard scores with 100 being the mean and standard deviations of 15 above and below the mean. So, you see the experimental group, these people have difficulty understanding themselves or poor self-awareness. In spite of this difficulty, they were able to adequately describe themselves. They had significantly lower scores on overall emotional intelligence specifically on the intrapersonal composite scale. Intrapersonal is the scale that measures the ability to look at one's emotions, one's feelings, and express them. So, this makes sense. People who are brain damaged and have difficulty in self-awareness are able to describe themselves on this self-report measure of EI. What happens with many personality tests – I can give you the reference later – is that generally you receive scores that are in the average range or above average with people with this type of brain damage.

However, these scores are significantly lower than the mean, indicating that these people are focusing on something and describing themselves fairly accurately.



## **The Impact of Emotionally and Socially Intelligent Behavior on Scholastic Performance**

With regard to the impact of EI on scholastic/academic performance, I'll describe two studies that examined this type of performance in high school and in college.



On a sample of 667 high school students in Canada, Jim Parker received their scores on the youth version of the EQ-i (the EQ-i:YV) at the beginning of the school year and their GPA (general grade point average) at the end of the year. He did a path analysis and found that the overall correlation between EI and GPA was .41. Although this not like the .6 to .8 correlations typically received between cognitive intelligence (IQ) and GPA, but it nevertheless suggests that part of the ability to perform at school is related to emotional intelligence.

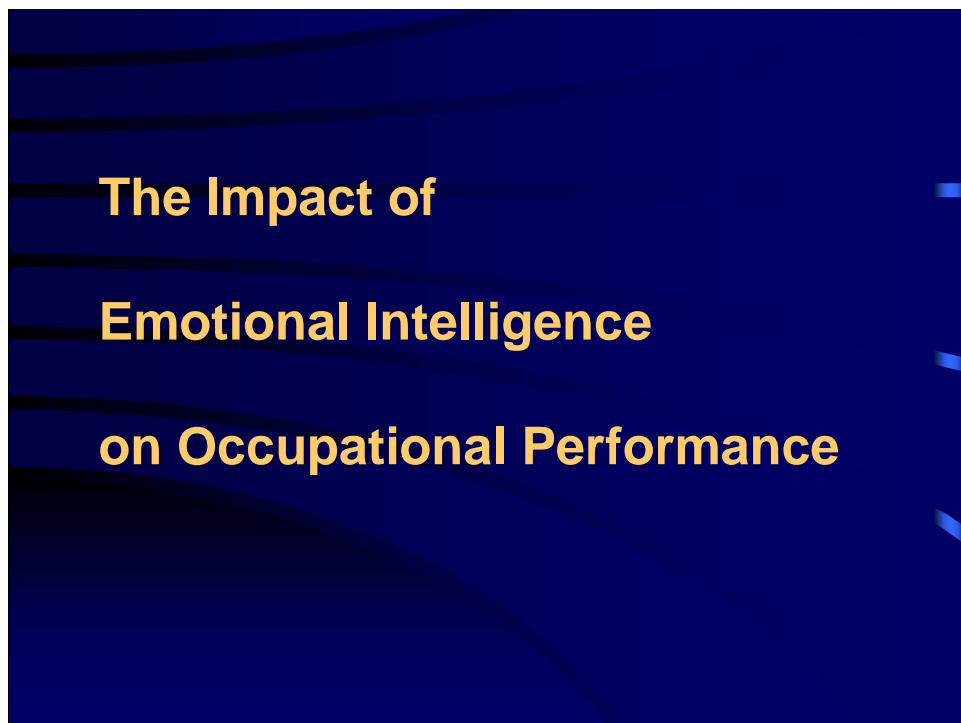
## The EQ-i Scores that Significantly Distinguish between Successful and Unsuccessful University Students

[Swart, 1996; n=448, South Africa]

EQ-i	Successful	Unsuccess.	t-value	p-level
Stress Tolerance	99	95	3.57	.01
Reality-testing	90	84	4.20	.01
Problem-solving	98	95	2.11	.04
Self-actualization	98	93	4.27	.01
Optimism	96	92	3.07	.01

A graduate student at the University of Pretoria looked at 448 South African students. She received their EQ-i scores in the beginning of the academic year and their GPA at the end of the year. She divided this sample into “successful students” (whose GPA was 1 SD above the mean) and “unsuccessful students” (whose GPA was 1 SD below the mean). And this is what she received. These are the five highest EI factors that differentiate between the successful and unsuccessful students based on this sample – stress tolerance, reality testing, problem solving, self-actualization, and optimism. Once again, optimism is a facilitator. In addition to cognitive capacity, which has a high correlation with the ability to get grades, evidently one needs to withstand the stress of going to university to perform well. Quite often it’s the first time that they are away from home. So the ability to withstand stress is evidently important.

Reality testing (which is bringing things into correct perspective and being able to validate thoughts and feelings), problem solving (on a personal and interpersonal level), self-actualization and optimism (which are facilitators) are additionally important for performing well at college. Self-actualization is defined, in the Bar-On model, as the ability to set goals and the drive to accomplish them in order to develop one’s potential. Self-actualization together with optimism are more motivators than actual components of emotional and social competence as was previously mentioned.



With respect to the impact of emotional and social competence on occupational performance, there are a number of studies. I selected those studies that I think describe this relationship well.

## An EI Model that Predicts Successful Military Recruiters

[Handley, 1997; n = 590, USAF; R = .52, odds ratio = 2.7]

- **Emotional Self-awareness** (Est.=.037, SE=.020, t-ratio=1.9,  $p=.050$ )
- **Empathy** (Est.=.041, SE=.015, t-ratio=2.8,  $p=.004$ )
- **Assertiveness** (Est.=.046, SE=.009, t-ratio=4.8,  $p=.000$ )
- **Problem-Solving** (Est.=.026, SE=.009, t-ratio=2.9,  $p=.003$ )
- **Happiness** (Est.=.038, SE=.010, t-ratio=3.7,  $p=.000$ )

One of the first studies that examined the impact of EI on occupational performance was conducted in the U.S. Air Force. It began in 1996 as response to a serious problem that military recruiters were experiencing. The job description of these recruiters is to recruit civilians into the Air Force. They are similar to salespeople.

The Air Force's primary problem was that approximately 100 recruiters per year turned out to be mismatches. In other words, they were not filling their annual recruitment quotas and thus were proving to be unsuccessful at their jobs. They found that after six to seven months on the average, they were returned to their previous positions in other units because of poor performance. This cost the Air Force approximately \$30,000 per mismatch which included the expense to recruit them, train them, and pay them a salary for six to seven months. For 100 mismatches, this amounted to \$3,000,000 a year. The Air Force, thus, began to consider various other ways to improve their recruitment procedures. Amongst the other ways that were considered, they added the EQ-i in an effort to see if this could identify high and low performers, and to reduce the high numbers of mismatches per year. The Air Force operationally defined successful recruiters as those who were able to meet 100% or more of their annual recruitment quotas; and unsuccessful recruiters were defined as those who were unable to fill more than 80% of their annual quotas. In addition to this clearly defined criterion for performance, approximately 1,100 recruiters completed the EQ-i. A total of 590 recruiters were identified within this sample who were considered to be either "successful" or "unsuccessful" recruiters based on their ability to recruit 100% or more of their annual recruitment quota or less than 80% respectively.

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- **Happiness** (Est.=.038, SE=.010, t-ratio=3.7,  $p=.000$ )

A logistic regression analysis was applied to the data, and the model that emerged is the one you see on the slide. This model rendered an overall regression coefficient of .52. The odds ratio was close to three as you can see. This is the model that emerged. These are the most powerful predictors of performance in this model; they predict who will be a good or a poor recruiter in the sample studied. First, they have to have high levels of emotional self-awareness; they have to be aware of their emotions in order to be in control of them. They also have to be empathic in order to be aware of how others feel, which is evidently important in being a good recruiter or salesperson. They have to have adequately high levels of assertiveness; this means that they have to be effective in constructively asserting their feelings, which is part of being a good recruiter as well as salesperson. Problem solving is another important characteristic of being a good recruiter as well. They have to be good at coming up with good solutions to the problems they encounter on a daily basis. Although they have supervisors, most of their work is done alone which means that they have to rely on themselves for the most part to come up with on the spot solutions. Last, happiness apparently plays an important role in their successfully doing their job. Once again, this is a facilitator and evidently acts to generate a positive disposition and be self-motivated to do their work.

## An EI Model that Predicts Successful Recruits

[Bar-On *et al.*, in press; n = 335, IDF, Israel; R = .55, Class. = 78%]

EQ-i	Lambda	F-value	p-level
Self-Regard	.731	6.48	.012
Impulse Control	.721	4.68	.032
Reality-Testing	.720	4.50	.036
Emotional Self-awareness	.720	4.47	.037
Independence	.709	2.56	.112
Interpersonal Relationship	.707	2.21	.140
Problem-Solving	.703	1.46	.229

I received a sample of 2,500 new recruits in the Israeli Defense Forces (IDF). Within this sample, I identified 335 soldiers whose performance was assessed over a period of one year by two different commanders who gave identical ratings on six different aspects of performance. This represented a very robust rating over a period of one year, and gave a very good indication of their actual performance over time. I divided the sample, based on their performance, into high and low performers. The model I'm going to show you is based on discriminant function analysis and the canonical R was .55, which is fairly high. The classification accuracy of this model was close to 80%, which means that one would expect to identify 8 out of 10 high and low performers based the degree to which their EQ-i scores match the structure of this mode. This is the model that appears. The strongest predictors of performance, based on this sample are self-regard (the ability to accurately assess oneself), impulse control (the ability to control emotions effectively), reality testing (the ability to be realistic and keep things in correct perspective), and emotional self-awareness as well. These are the EI competencies that best predict who will be a successful or unsuccessful recruit for the sample studied.

## An EI Model that Predicts Effective Leadership

[Ruderman, *et al.*; n = 300, CCL; R = .74, Class. = 86%]

- **Social Responsibility** ( $F=12.05$ ,  $p=.001$ )
- **Empathy** ( $F=8.55$ ,  $p=.005$ )
- **Interpersonal Relationship** ( $F=7.72$ ,  $p=.008$ )
- **Stress Tolerance** ( $F=6.71$ ,  $p=.013$ )
- **Problem-Solving** ( $F=5.94$ ,  $p=.019$ )

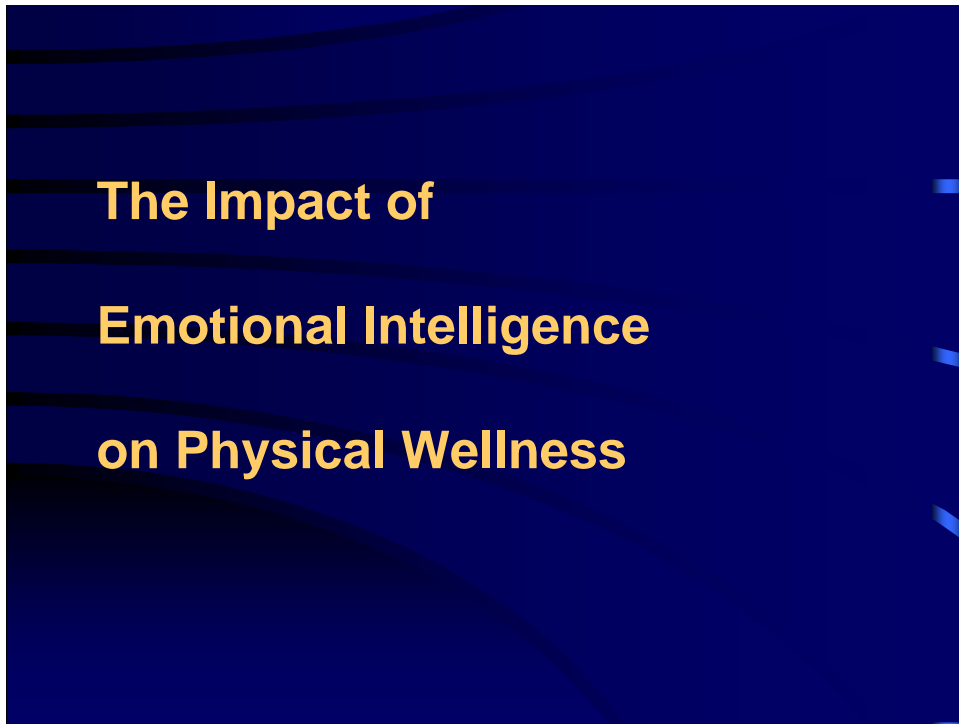
Another study that clearly demonstrates that EI impacts performance in the workplace was conducted on 300 executives at the Center for Creative Leadership. These 300 executives represent a fairly random selection of different types of executive leaders working in various positions in a wide variety of organizations across the US. In addition to completing the EQ-i, their performance as leaders was rated with the Benchmarks multi-rater. Benchmarks is a multi-rater developed by CCL that is completed by co-workers, supervisors and subordinates who rate the individual on 16 aspects of “successful leadership” and five aspects of “derailment” which is the potential for very unsuccessful leadership. Each individual was rated by an average of seven to eight co-workers. Based on the Benchmarks’ ratings, I divided this sample into the top third and bottom third with respect to their leadership ability. Discriminant function analysis was applied to the data, and we came up with a very strong canonical R of .74, indicating the over 50% leadership is dependent upon EI based on the sample studied. The classification accuracy of this model that I’m going to show you is close to 90%, meaning that one would expect to identify leadership potential in 9 out of 10 individuals by applying this model. And this is what the model looks like. It is interesting that the five strongest predictors in this model are related to social awareness (Empathy), social interaction (Interpersonal Relationship) and social behavior (Social Responsibility). These first three predictors are what many consider to be “people skills” as they are often called. And the last two predictors are stress tolerance and problem solving, which also makes sense. Positions of leadership generate stress, and those who are adept at managing stress make the most successful leaders. And problem solving is also an obvious ingredient for successful leadership.

## An EI Model that Predicts Managerial Performance

[Langhorn, 2003; n = 156, UK; **R = .44**]

EQ-i	Beta	<i>t</i> -value	<i>p</i> -level
Optimism	.311	3.08	.003
Social Responsibility	.308	2.52	.013
Emotional Self-awareness	.234	2.15	.034
Self-actualization	.169	1.47	.144
Happiness	.163	1.48	.141

Here's another study that clearly demonstrates the impact of EI on performance in the workplace. This research was conducted by a doctoral student in the UK on a sample of 156 managers. In addition to completing the EQ-i, the managerial performance of these managers was assessed by their supervisors. He applied multiple regression analysis to the data, and these are the most powerful components of this particular model. The multiple R is .44, which once again indicates that EI impacts managerial performance although this is considered a moderate relationship.



# **The Impact of Emotional Intelligence on Physical Wellness**

I will now, very quickly, discuss the relationship between EI and physical health. I'm somewhat apprehensive about showing this to you, because the direction of causality is still not certain and necessitates further research. The vectors can go in both directions. EI very likely impacts physical health, and positive physical health might tend to enhance EI over time.

## The EQ-i Scores that Distinguish between Adolescent Cancer Survivors and a Control Group

[Krivoy et al., 2000; n = 70, Israel]

- Assertiveness ( $p = .041$ )
- Stress Tolerance ( $p = .065$ )
- Reality-testing ( $p = .079$ )
- Problem Solving ( $p = .020$ )
- Optimism ( $p < .000$ )

In this study that was conducted in Israel, we compared a group of adolescent cancer survivors (who were five years symptom free) with a randomly selected group of adolescents who were matched for gender and age. We were interested in examining the possible relationship between EI and cancer survival. It was expected that this would tell us something about the role played by EI in successfully dealing with a life-threatening disease. The experimental group was comprised of 35 children. They were young adults when we first examined them with the EQ-i with an average age of 21; all of them were first diagnosed with cancer in childhood or in early adolescence. A simple t-test was applied to examine for significant differences between the two groups. We found that five of the EQ-i scales were able to indicate significant or near significant differences between the cancer survivors and the controls. These are listed on the slide. The EI factor that demonstrated the most significant difference between the cancer survivors and the controls was optimism, which once again is a facilitator of emotionally and socially intelligent behavior. The results regarding optimism confirm similar findings in the literature. A strong optimistic attitude is evidently very important in dealing with cancer. The other four EQ-i scales that demonstrated significant or near significant differences between the two groups were assertiveness, stress tolerance, reality testing, and problem solving.

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These results make sense. It is apparently important to express how one feels (assertiveness) regarding this life-threatening condition and the difficult treatment that it necessitates. Also, the ability to manage one's emotions (stress tolerance) and to be realistic about one's condition (reality-testing) seem to be important ingredients in fighting cancer. And of course, personal and interpersonal problem solving appears to be important to deal with very serious medical problems such as cancer. This study needs to be replicated on larger and more diverse samples.

## An EI Regression Model that Predicts Psychological Wellness among New Recruits

[Bar-On, 2003; n = 456, Israel;  $R = .39$ ]

EQ-i	Beta	t-value	p-level
Social Responsibility	.170	2.95	.00
Flexibility	.142	2.30	.02
Self-actualization	.139	2.23	.03
Reality-testing	.130	1.97	.05
Stress Tolerance	.113	1.53	.13

My examination of the impact of EI on psychological wellness was, once again, conducted in the IDF on a very large sample of close to 2,500 recruits, all of whom completed the EQ-i just prior to their induction into active military service. Within this sample, I identified 152 male soldiers who were discharged from active service because of psychiatric reasons. I then compared this group with a randomly selected group of 152 male soldiers who received a less severe psychiatric profile that allowed them to continue to serve a full tour of duty. These two clinical samples were then compared with a randomly selected group of 152 male recruits who never received a psychiatric profile during their tour of duty. This created three groups that represented three different degrees of psychological wellness based on the level psychopathology or lack thereof. And a multiple regression analysis was applied to their EQ-i scores. This created the regression model that appears on the slide. You can see that the multiple regression  $R$  is .39, demonstrating a moderate yet significant relationship between EI and psychological wellness.

I notice that I have just a few more minutes, so I will try to quickly present what remains in this presentation and will hopefully allow time for a few questions.

## **The Application of EI in the Workplace**

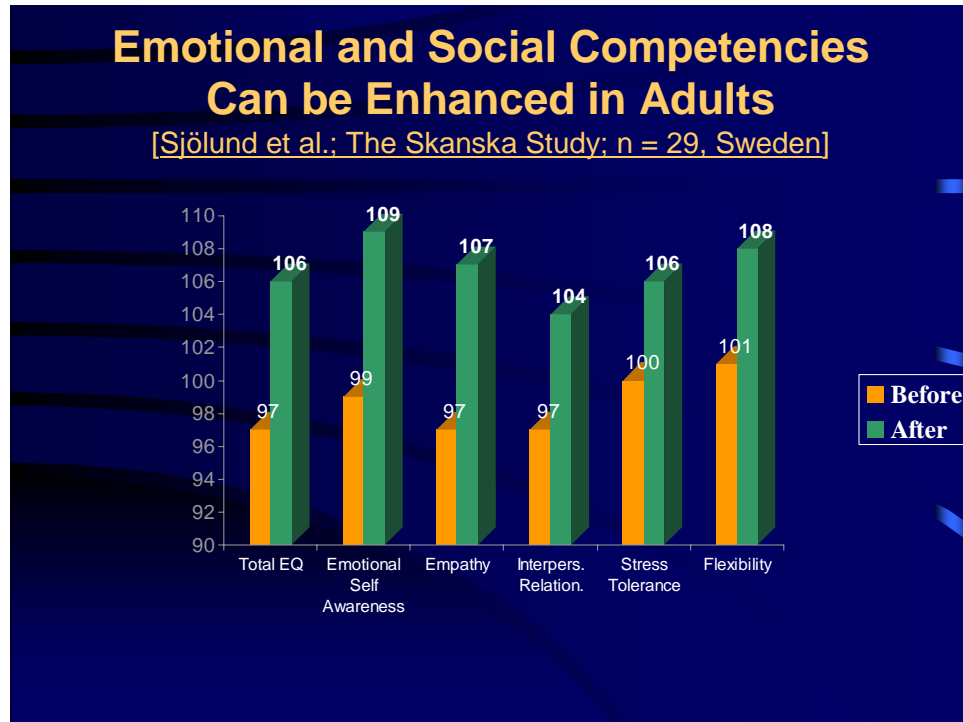
- Hiring
- Training/coaching
- Succession planning

Essentially, these are the three most popular applications of EI in the workplace today based on my experience with the EQ-i over the past few years. The EI is applied primarily in hiring new employees and training employees within organizations worldwide. This training includes individual coaching as well as in group training. To a lesser extent, it is beginning to be used in succession planning. So, it is used to hire, train and promote individuals to be more effective and successful employees. And the idea is that more emotionally and socially intelligent employees make more effective employees, and more effective employees will contribute to making a more productive organization (which needs to be empirically studied of course). Much of this work is based on the creation of regression models and using them in hiring, training and succession planning; these models are based on the ability of EQ-i scores to identify high and low performers and are created individually to predict successful and unsuccessful performance tailored for particular organizations. It is rather simple to create these models, and their use has been quite successful for the most part based on my experience.

### **What was gained by using an EI model in the USAF ?**

- An increase in their ability to identify successful recruiters by nearly 3-fold
- Not wasting approximately \$ 3,000,000 annually on mismatches
- Recruiting more successful recruiters who are able to recruit more successful recruits
- A Congressional Report submitted by the GAO praising their use of the EQ-i (Jan. 1998)

I would like to explain what the U.S. Air Force gained from the study I described earlier. This was not simply an interesting academic exercise, but a project that has proved to be extremely beneficial for the Air Force. They were successful in increasing their ability to identify successful recruiters by nearly threefold (the odds ratio was 2.7 as I conveyed earlier). They reduced their mismatches by 92% thus saving or at least not wasting close to \$3 million a year. Then, of course, this is the top of the iceberg. You would expect that more professional recruiters could make better judgments about the people they recruit which would be expected save a great deal of government funding. And as an aside, the U.S. General Accounting Office submitted a congressional report to the US Senate praising the use of the EQ-i in the assessment program in January 1998.



After demonstrating that EI has an impact on human performance, a reoccurring question that arises and one which was echoed yesterday in this conference is: “Can these EI competencies be enhanced in order to increase performance at home, school and in the workplace?” One way answering this question in the affirmative is to quickly show you the results that were obtained from a study that was conducted in Sweden. The researchers administered the EQ-i to a group of 29 executives before and after they received an EI-enriching program that was part of a workshop that they participated in designed to enhance managerial skills. The yellow line represents their EQ-i scores before the EI-enriching part of the workshop, and the green line represents the scores during the post-test. The interval between pre- and post-intervention assessment was approximately two months. These are all significant changes between the pre- and post test. This is not only an indication that it is possible to increase EI over a relatively short period of time with simple didactic techniques, but it also suggests that these components are most likely not personality traits like a number of psychologists have assumed – personality ‘traits’ are simply not as malleable, changeable and learnable as these EI factors appear to be. And it was really interesting that in addition to overall EI, the EI factors that exhibited the most improvement were emotional self-awareness and empathy, which are recognized by many to be the key components of emotional intelligence. Another interesting finding was that those who began this workshop with the lowest EQ-i scores were the ones who made the most change, which is important and encouraging because these are the people who need to enhance their EI the most.

## **The Application of EI in Educational Settings**

- EI-enhancing programs
  - e.g., CASEL, CSEE, Self-Science, etc.
- High-risk models for predicting attrition
- Individual intervention

Very quickly, these are the primary applications of EI in education. However, I will not get into this and leave it to Joe Zins who will be presenting right after me. He will get into detail in this particular application of EI. I would just like to say that this is not a new or “trendy” application that began shortly after Goleman’s publication of *Emotional Intelligence* in 1995, because such programs have been around for many years. For example, one of the first programs is the Self-Science curriculum that was developed by Karen McCown in California during the mid 1960s. However, today these curricula are much more popular in this country and abroad.



## DISCUSSION

### DISCUSSION

**DR. ROBERTS:** Thanks, Reuven. I guess we've got time, for five minutes of questions. Jack?

**DR. MAYER:** We recently reported in the *Journal of Personality and Social Psychology Bulletin* a correlation between the MSCEIT and the Bar-On EQ-i of about .18. Before that, as we prepared our test manual, we asked the director of research at MHS to look at all the existing correlations between the MSCEIT and the EQ-i. And the weighted mean across samples for the correlation was – I can't remember it exactly – but it was somewhere between .22 and .26.

**DR. BAR-ON:** There were two studies that director of research at MHS passed on to me, Jack. What I presented here is the study that [interrupted].

**DR. MAYER:** Yeah, so I'm wondering about this .46 that you have in your handout and in your talk.

**DR. BAR-ON:** There were two studies that I received from Dr. Sitarenios at MHS. One was the study that was based on, I think, a sample of 30 people and the other on sample of 137 subjects. I don't remember exactly. What I presented here is the larger sample, for which the overall correlation was .46. And I think that the other study you're referring to included 30 students from a small university in Canada, for which the overall correlation coefficient was .36.



**DR. MAYER:** Can you tell us where the sample with the .46 came from?

**DR. BAR-ON:** I don't remember offhand... I'll find that information and send it to you later after the conference. I believe it was conducted by Prof. James Parker at Trent University in Canada and presented at the National Association of School Psychologists in Toronto in 2001. I'll check to be sure.

**DR. MAYER:** Yeah, I'd like to see that.

**DR. BAR-ON:** Sure. I received it from the same source you're talking about at MHS, Dr. Siteranios who is the director of research.

**DR. MAYER:** Well that's weird. That's unusual because we didn't receive that number.

**DR. HEIDER:** This is the cultural question. You said EQ-i has been translated and applied in 30 languages. There is a difference between language translation and cultural transformation. To what extent did you alter it, taking into account cultural differences?



## DISCUSSION

**DR. BAR-ON:** The translations were not translated word for word. They were translated by people who are bilingual in the particular countries in which we translated them, and they were not mechanically translated word for word. There was some variation and some degree of flexibility in how they were translated. They were all back translated and examined by me. They were translated at least by two people, and back translated by at least two people as well. And when there were problems between the translations and back translations, I identified the item, the problem and requested a new translation and back translation. There, of course, were problems. In certain countries, the translators would flag certain items that were particularly difficult to understand and translate. Some of this work was done when this test was still being developed before it was officially published and continued after publication. When we look at basic differences, there are definitely some gender and age differences, a question that was asked yesterday.



## DISCUSSION

**DR. BAR-ON (CONT'D):** We have sufficient information today that if you look at age groups, EQ goes up significantly but mildly for older people. There's a gender effect but not in overall effect on emotional intelligence, but in certain sub-areas. For example, in empathy and interpersonal relationships, there definite are gender differences. In almost every country in which we have administered the EQ-i, which I can think of right now, there are significant differences between men and women, and women come across as more adept than men in empathy and interpersonal relationship. And we also find differences in scores between country and country, and the only thing that this means to me is that it justifies the use of local norms when you're using the test in different countries which is a given in testing. Yes, there are differences.

**DR. GRANDEY:** I wanted to know... you presented a lot of evidence about the convergent validity and construct validity. I wonder if you could just say a little bit about the discriminant validity. What is it not related to?

**DR. BAR-ON:** That's right. I didn't include information like this in my presentation, but what Jack presented yesterday – I think it was Jack – the correlation coefficients between the MSCEIT and various tests of cognitive/academic intelligence range between .00 to .30. Is that right, Jack?

**DR. MAYER:** Yeah, .36.

## DISCUSSION

**DR. BAR-ON:** Did you say that they range from .00 to .36? And this is also approximately the same range for correlations between the EQ-i and measures of IQ. Four studies come to mind at the moment. I can send you this information. I have correlations between the EQ-i and the Raven, GAMA, WISC and WAIS based on at least four studies I can think of offhand, or perhaps five studies. The correlation coefficients range between .02 (not significant) and .33/.34 (significant). And the interesting thing is that the age of the subjects and/or the particular measure of cognitive intelligence may impact the results. Generally, when the Raven is used to measure cognitive intelligence, the correlations tend to be lower. But correlations between the EQ-i and the WISC and WAIS are higher. When younger respondents are tested, the correlations tend to be higher than those for adults.

**DR. GRANDEY:** I was thinking more also along the lines of like the big five or other personality measures. Because what it seems like is that you have all these different dimensions and you're using them in a similar way that we might use them at say a 16-dimensional personality or a 5-dimensional personality, but you don't often talk about that as one thing. You talk about them as individual dimensions.

## DISCUSSION

**DR. BAR-ON:** There are only a handful of studies in the literature that have examined the degree of correlation between the EQ-i and personality measures, no more than five that I can think of offhand. Most of these have examined the degree of correlation with the NEO. There tends to be a significant correlation with most of the five factors. The lowest correlation is with openness. The highest correlation is with neuroticism. And the correlations do not exceed .5 for the most part. There are lower correlations of course. We need more information to see, from other samples, larger samples, more diverse samples from around the world. This will take a while. I think it's probably too early to do a meta-analysis.

I really don't like the categorization of "mixed models". I think it doesn't convey a lot of important or relevant information. Most models are mixed! Personality definitely affects the way one performs. It definitely has an impact on emotional and social intelligence. But, once again, we need more research to get to something more definitive with this regard.

**DR. ROBERTS:** I'm going to ask you a question. Emotional Stroop; is the correlation with the EQ-i positive or negative?

**DR. BAR-ON:** I think it was positive. Excuse me ... I think I made a mistake. I think it's a negative correlation. You're right!

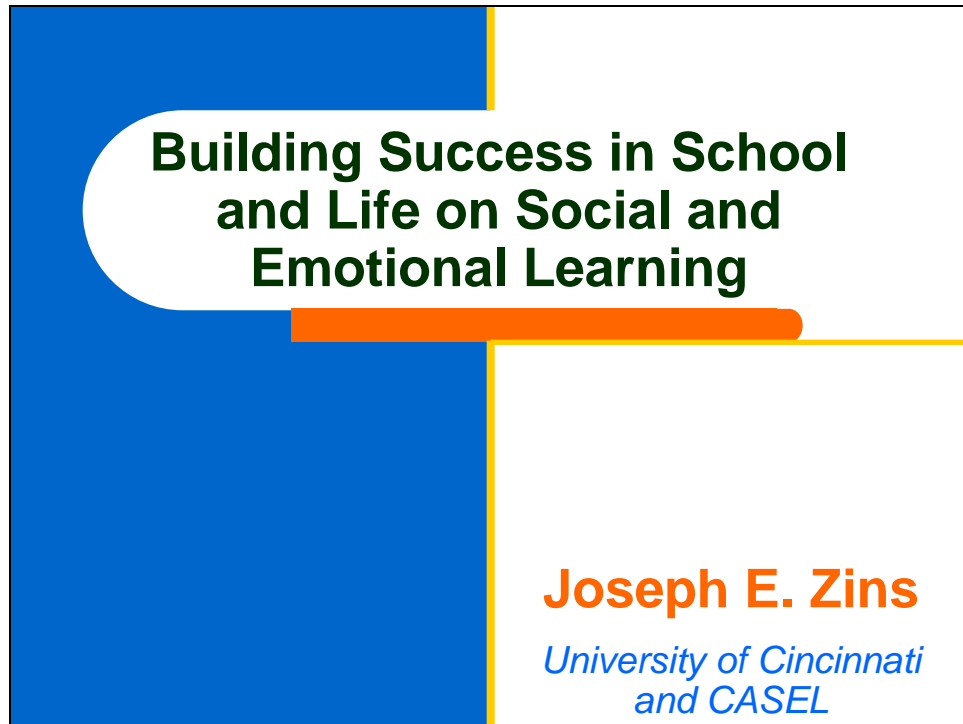


## DISCUSSION

**DR. IRVINE:** A quick question. Work that we did at Lackland Air Force Base -- Rich Roberts, Pat Kyllonen, and I -- looked at health-related quality of life in recruits showed that we could identify recruits at risk from dropping out with health-related quality of life questionnaires. Have you yourself had the opportunity to; that's an amazingly burgeoning field, almost as fast as this one. It tends to relate your instrument to any of these HRQOL things?

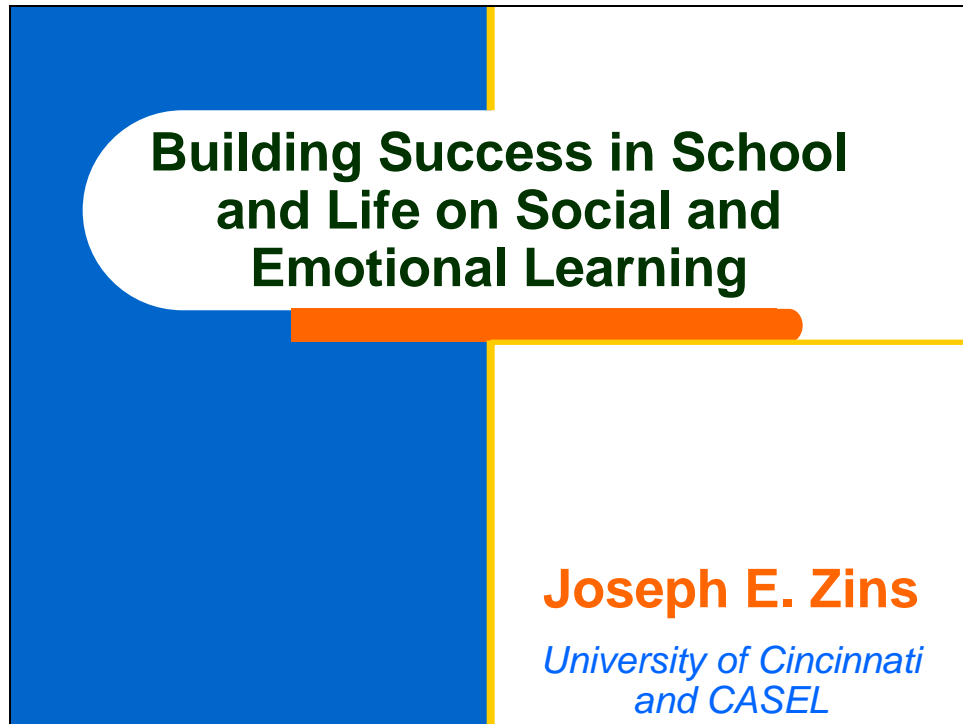
**DR. BAR-ON:** I haven't examined this relationship in the studies that I've conducted; but I'm almost positive there have been studies, and I think that I remember something about a study with quality of life. I don't remember, but I'll try to go back through my emails and send you something if you're interested. I'd imagine there probably would be or should be.

**DR. ROBERTS:** Thanks, I am going to hand the chair now over to Gerry.



## **BUILDING SUCCESS IN SCHOOL AND LIFE ON SOCIAL EMOTIONAL LEARNING**

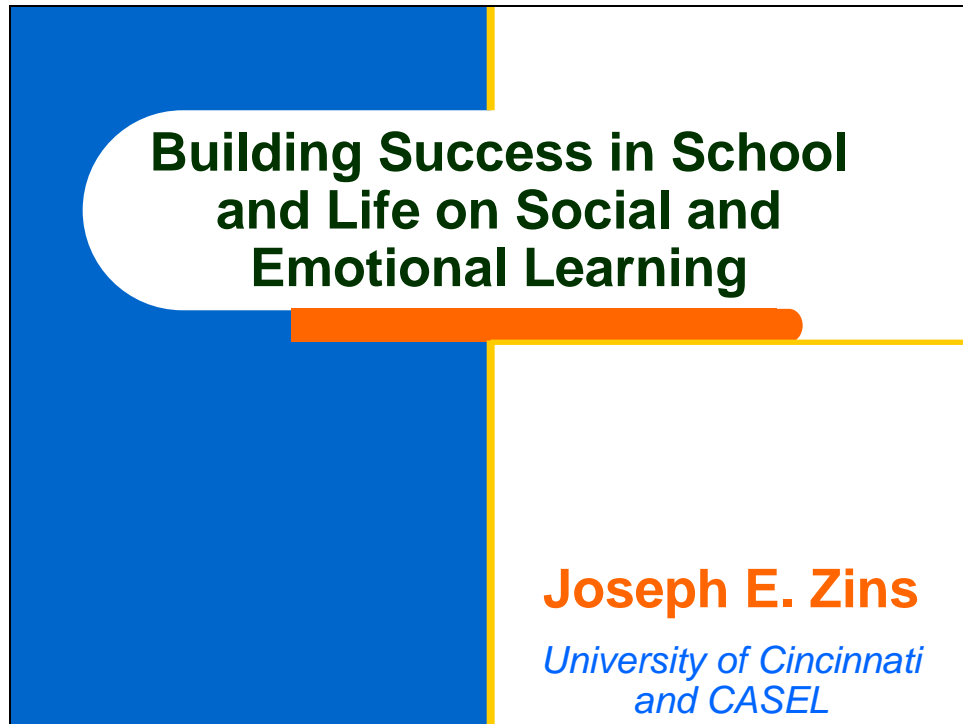
**DR. ZINS:** Good morning. I always find it interesting when you get introduced at these things. It reminds me of the time a number of years ago when I was a psychology practitioner. I do my work with children and families, and I was working in the schools. I went into a classroom; I think it was a first or a second grade classroom, to do an observation of a child. There was one kid in class whom I guess had missed a lot and he didn't know who I was, because I'd be in and out of classrooms all the time, and all the kids knew who I was and really didn't pay attention to me. So I was sitting in the back being unobtrusive, and that was in the days when I could fit in the little chairs, and as you know when you get older, you don't fit in those chairs very well anymore – at least some of us don't. But anyway, I was sitting back observing a child and this other kid who hadn't been there very often, kept turning around, kept looking back at me. This kid did not have a lot of impulse control, and right in the middle of class he blurts out, "Who's that?" And the teacher stops class and goes over to him and says, "Well that's Dr. Zins, and he helps us out sometimes, and he's a special teacher" and similar kinds of explanatory things. And in response this kid gets this frightened look on his face and says, "Doctor? Doctor?" And then says loudly, "He's not giving me a shot." And this kid next to him demonstrates some of the EI ideas we're talking about---he goes over, puts his arm around him, and says, "Nah, he's not that kind of doctor. He's the one who calls off school when it snows."



So what I'm trying to demonstrate with this little story is that the focus of my talk is a lot different than what we've heard so far. As I said, I do my work in schools with children and families. It's applied work and much of it is based on the research that the rest of you have done, and so I hope you'll be able to see some of those applications and connections.

As you can see I'm at the University of Cincinnati, and it's nice to see my colleague Gerry Matthews here. You know since we don't see each other at the university, we have to travel across the country to see one another.

Anyway, I do my work with a group called the Collaborative for Academic, Social and Emotional Learning. That's CASEL and my efforts with these colleagues form the basis of my talk. I'll mention them more a little bit later on. What I'm going to do is talk about social and emotional learning. I'll start off talking about why we need to address these social and emotional issues with children. I'll define what it is, the rationale for it. I'll provide a working model for programming in this area, and I'll talk about some research support for effective SEL interventions and also some related to academic outcomes for kids.



When you think about our schools, there are many kinds of things of an emotional kind that we face. And I think about what Paul Gade said when he started – what was that, two weeks ago when we started? When he started, he was talking about the principal going to the school and being hesitant to go back in the morning and so forth. And what I would like for all of you to do is think of, I want to do a little exercise with you for just a minute, if you'll bear with me. I want you to think about a place where you feel safe, where you feel comfortable, where you can say pretty much what you want, let your hair down, dress however you wish, where you're always accepted. And if you would just talk with each other for just a minute about that place, tell one another where it is. If you just find somebody nearby. [Group talking among themselves.] Okay, what kind of places did people think about?

**AUDIENCE:** Home and work.

**DR. ZINS:** Home and work?

**AUDIENCE:** Mostly home.

**DR. ZINS:** Mostly home? Anybody else? Any other places?

**AUDIENCE:** Walking in the woods with my friend and my dog.

**DR. ZINS:** Great. Walking in the woods with her friend and dog. Any others?

**AUDIENCE:** The beach.



## Challenges Facing Students

- Economic and social pressures
- Alterations in family composition and stability
- Breakdown of neighborhoods and extended families
- Weakening of community institutions
- Less contact with parents/significant adults
- Frequent adult modeling of selfish & unethical behavior
- Ongoing exposure to media encouraging health-damaging behavior
- Mental health problems

**DR. ZINS:** The beach. Sounds good, especially when we look out here at the weather right now!

When you think about those places, that's the kind of place we want for our schools to be for kids. We want them to feel safe. We want them to feel like it's okay to make a mistake. We want them to feel supported. We want them to feel cared for. When you think about schools, that's how we really want them to be. And we know kids are facing many different challenges today [points to slide], and I could go on and on about these, and you're as aware of all of these things as I am. Kids are facing a multitude of issues that need to be addressed. We who work in the schools can do something to help them.



## Vision for Students' Success

That every student live a satisfying life and meet life's challenges by:

- Developing academic competence
- Achieving personal goals
- Fulfilling family responsibilities
- Enjoying good health
- Producing high-quality work
- Contributing to their community

And so we have a vision for kids' success. We want kids to be successful academically. We want them to achieve their personal goals. We want them to fulfill their family responsibilities, have good health, produce high quality work, and contribute to their community. If you think about it, that's what we want to accomplish in our schools. Those are our ideal outcomes for kids. And that's what we try to do with the interventions that I'm going to be talking about.




## What is SEL?

Educational process of acquiring knowledge, skills, attitudes, and beliefs to:

- Recognize and manage emotions
- Care about and respect others
- Make good decisions
- Behave responsibly and ethically
- Develop positive relationship

(Elias et al., 1997)

I mentioned the term social and emotional learning, or SEL, which is what we in CASEL call this concept. So what is SEL? It's an educational process requiring knowledge, skills, attitudes, and beliefs. These aspects should look familiar to you. To recognize and manage emotions, to care about and respect others, make good decisions, behave responsibly and ethically, develop positive relationships. That's what I mean when I talk about SEL or social and emotional learning.




**Why Instruction in Social and Emotional Learning (SEL)?**

- Emotions affect how and what we learn
- Risk of maladjustment, failed relationships, unhappiness reduced
- Positive effects on academic performance
- Benefits to physical health
- Demanded by employers
- Essential for lifelong success

(Elias et al., 1997)

Why do we have instruction in SEL? Well, when kids go to school, whether we recognize it or not, their emotions affect how and what they learn, and a lot of times we don't recognize those issues. But kids are coming to school with a lot of different problems and barriers to their learning. You know, I noticed when we did our exercise here a few moments ago, there are a couple of people that no one wanted to talk to. I hate to say it, but it was pretty clear to me from up here (laughs). Some people were really trying to talk to others and others were rejecting them, and I'm not sure I understand all the reasons for these things. But this is just an observation that I saw here and, well, everybody has their EQ test and that was part of mine. Please be aware that I do take referrals for therapy and I'd be glad to meet with you after this meeting if you were one of the rejected ones!

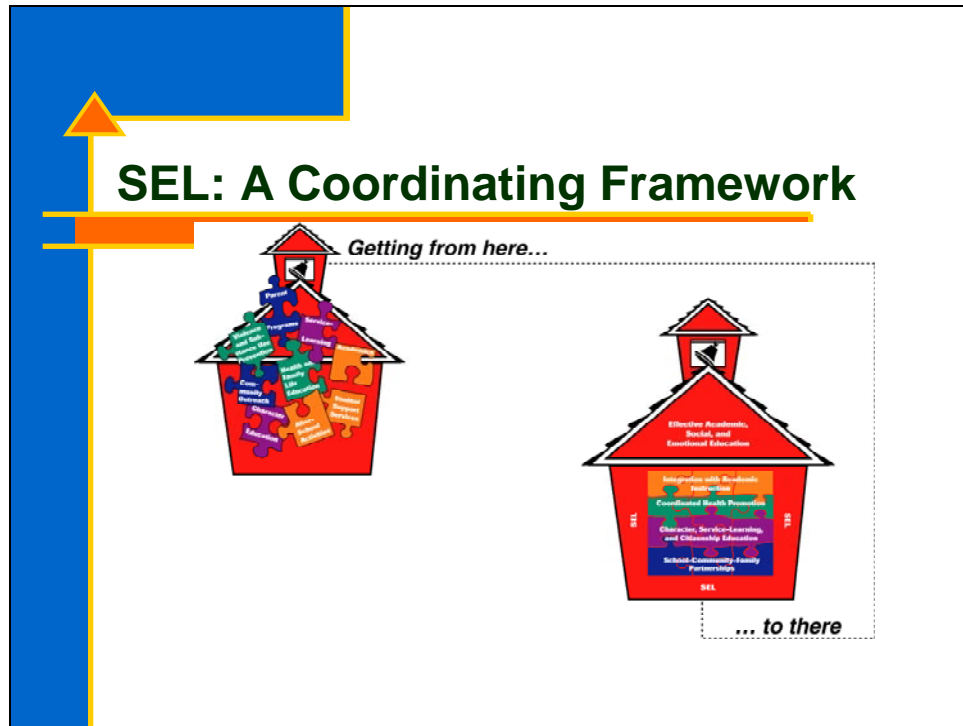


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Anyway, if we don't address social and emotional issues with kids, we run the risk of having them experience maladjustment, failed relationships, and unhappiness. On the other hand, addressing SEL may result in positive effects on academic performance that I'll talk about. There are also benefits to physical health, which I'm not going to go into other than to say that we worked with the Center for the Advancement of Health in Washington a couple of years ago. We identified a number of important links between social and emotional learning and physical health outcomes. SEL skills are also demanded by employers. If you look at the things that employers want, they include workers who can read and write and do math and related kinds of things. But they also want people who do what: the things that we've been talking about the past few days. They want people who can work on teams. They want people who can problem solve. They want people who can negotiate conflicts. So they want employees with all those skills and they expect schools to produce those types of individuals. And further, those skills are essential for lifelong success, for people basically to be happy, to be satisfied. We want them to have high EI for their entire lives.



From CASEL, 2003

Another thing that social and emotional learning does is related to all the different prevention programs we have in schools. We've got AIDS prevention. We've got all the anti-bullying programs, drug and violence prevention, civic and character education. We've got all these different programs that are going on simultaneously, and they all use their own language and they typically don't talk to one another about what they're doing. Thus, SEL provides a coordinating framework, or an umbrella under which all those other programs can exist and compliment one another, which enables us to organize some of these activities a little better, thereby supporting and reinforcing one another's efforts.



## Influences on Academic Performance Studies

Wang et al. (1997) examined 28 categories of influences on learning based on 179 handbook chapters, 91 research syntheses, and surveys of 61 national experts

Another reason we want to look at SEL can be found in the work that Margaret Wang and her colleagues did a couple of years ago when they examined 28 categories of influences on learning. They found that eight of the top 11 most influential categories involved social and emotional factors, like student-teacher social interactions, classroom climate, the peer group, and so forth.



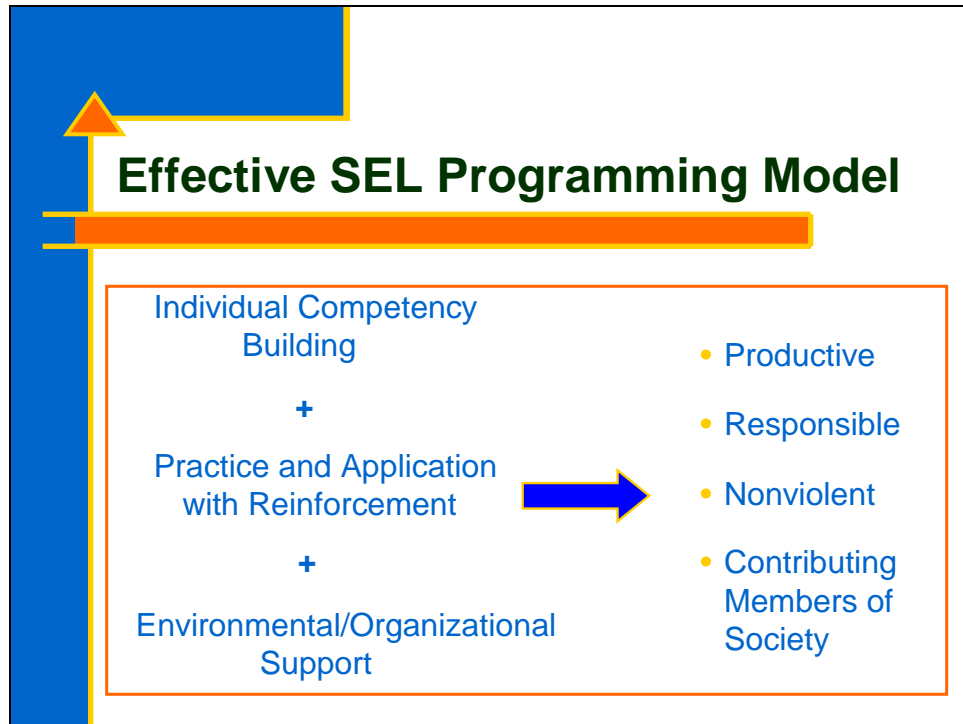
## Findings

- *Eight* of top *eleven* most influential categories involved *social and emotional factors* (e.g., student-teacher social interactions, classroom climate, peer group)
- **Conclusion:** *“direct intervention in the psychological determinants of learning promise the most effective avenues of reform”* (p. 210)

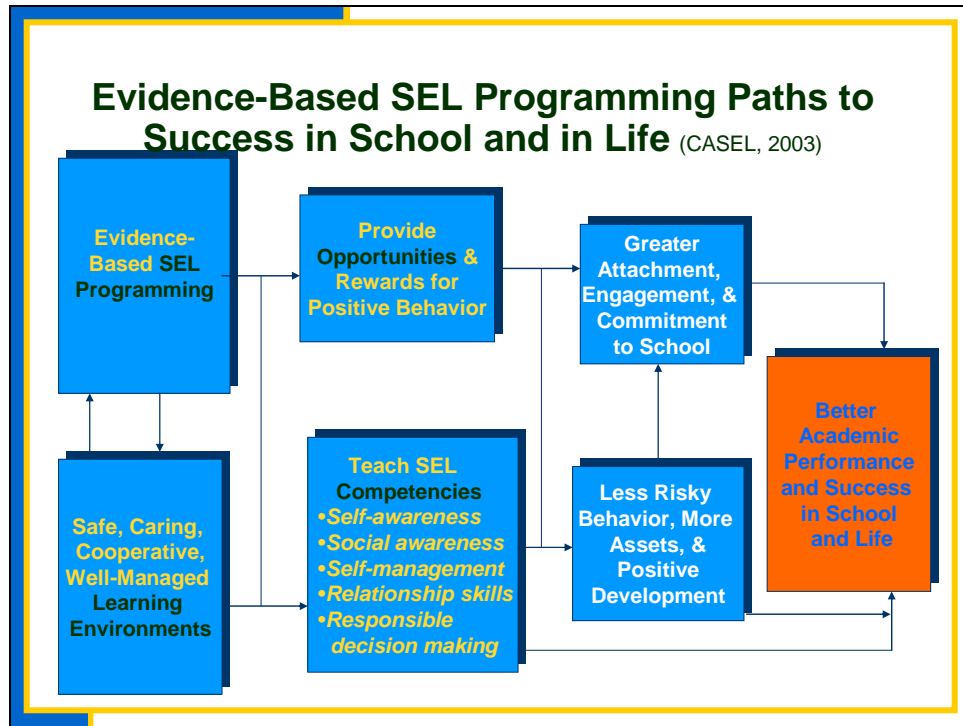
They concluded that direct intervention in the psychological determinants of learning promised the most effective avenues of educational reform, and so that's another solid reason why we want to provide this instruction. So, there's a lot of support for trying to implement these interventions in schools.




What I want to talk about next is: how does SEL work?



Here we have a working model of what effective SEL programming looks like, and there are three main components to this model. As you can see, we have individual competency building, so kids develop individual skills and competencies related to social and emotional learning. The second aspect is they need to practice and apply these and receive reinforcement for their efforts, so they need to have opportunities to engage in these behaviors. We can't just talk about these skills; we've got to make sure the kids have a chance to engage in them. And finally, this learning needs to occur within a safe, supportive, and caring environment, just the kind of place we were talking about earlier— one where kids are cared for, where there's warmth, where they feel like the teachers are concerned for them, where they have friends, and so forth. And hopefully what all three components lead to is children who are productive, ethical, responsible, nonviolent, contributing members of society.



Another way of looking at this learning is shown in this slide. When we have evidence-based SEL programming, we first have the SEL programming, the opportunities, the competencies, and the learning environments, those are all the inputs that we have. That's the way we're trying to structure things. So it may be necessary when we're implementing these interventions to work on building a safe, supportive, caring environment in this school as part of introducing the SEL program. Or, if such a climate already exists, we can then provide our SEL instruction in that context right away and they'd both make one another stronger. And again, we need to provide opportunities for rewards for positive behaviors.



## Key Competencies Taught Through SEL Programming

- Self-Awareness (e.g., identifying and recognizing own emotions, recognizing strengths)
- Social Awareness (e.g., empathy, respect for others)
- Responsible Decision Making (e.g., evaluation and reflection, personal responsibility)
- Self-Management (e.g., impulse control, stress management)
- Relationship Skills (e.g., working cooperatively, help seeking and providing) (CASEL, 2003)

Here are the SEL competencies that are part of an effective SEL program. These [points to slide] ought to look pretty familiar. We've been talking about them all along during this conference – self-awareness, social awareness, self-management, relationship skills, and responsible decision making. What teaching them hopefully leads to is kids who are engaging in less risky behaviors, who have more assets and more positive development, with greater attachment, engagement, and commitment to school, and then ultimately to kids with better academic performance and who are successful in school and in life. So that's the model that we're operating on, but remember that it's a working model that we're trying to continually improve.

Before elaborating on the key competencies, I first want to say that these skills are taught to kids in a variety of very ways. Teachers are incredibly creative. A lot of the programs have some really wonderful ways of teaching these skills. And they involve interactive methods so we're not just providing knowledge to kids. If you remember a number of years ago when we first did a lot of the drug prevention work, we simply provided knowledge or we showed pictures to frighten people so they wouldn't use drugs. Remember those days? Or today, if you look at the DARE program, they provide a lot of knowledge but not in the interactive ways we've discussed. What we've found is that just providing knowledge isn't good enough.



## **Key Competencies Taught Through SEL Programming**

Self-Awareness (e.g., identifying and recognizing own emotions, recognizing strengths)

Social Awareness (e.g., empathy, respect for others)

Responsible Decision Making (e.g., evaluation and reflection, personal responsibility)

Self-Management (e.g., impulse control, stress management)

Relationship Skills (e.g., working cooperatively, help seeking and providing)

(CASEL, 2003)

Similarly, at one point it was thought that if we simply taught kids to be good problem solvers, if they learned good decision making skills, that we'd be able to prevent all kinds of problems. Well, that wasn't enough either, so we've further refined the components of these interventions over the years. Now we have highly interactive lessons. We have teachers who model these behaviors for their children, rather than just telling them. Teachers do a lot of think aloud types of activities where they demonstrate their thought processes to their students. In classrooms, almost every day there's something that comes up where teachers are ready to lose their cool. You can imagine the different things that go on in kids' lives. So teachers can model how they deal with those kinds of issues, with those emotions. They have kids engage in things like role playing. They get performance feedback from their teachers and peers. They build in applications in real life and try to program for generalization. So there are a lot of very interactive, highly relevant activities going on.

These skills can be taught in stand-alone programs where there's a specific curriculum that teachers can use in their SEL class. In the New Haven schools, they have a whole Department of Social Development with a department head and department meetings just like English or math. They specifically teach SEL regularly to the kid's kindergarten through grade 12. In other schools, school staff integrate SEL into the everyday classroom activities. As an example, think about problem solving.



## **Key Competencies Taught Through SEL Programming**

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Social Awareness (e.g., empathy, respect for others)

Responsible Decision Making (e.g., evaluation and reflection, personal responsibility)

Self-Management (e.g., impulse control, stress management)

Relationship Skills (e.g., working cooperatively, help seeking and providing)

(CASEL, 2003)

Where do you cover that in school? It's all over the place. We teach it in math. We teach it in science. We teach it in history. So problem solving and other skills can be part of those classes where we teach relevant skills to kids.

Another place we can teach these skills is on the playground or at the lunchroom. When do kids have many of their battles at school? What happens as they pass through the hallways. Those places and those incidents are all opportunities when we can reinforce and teach these kinds of skills. There simply are many different ways that these skills can be taught to children throughout the day.

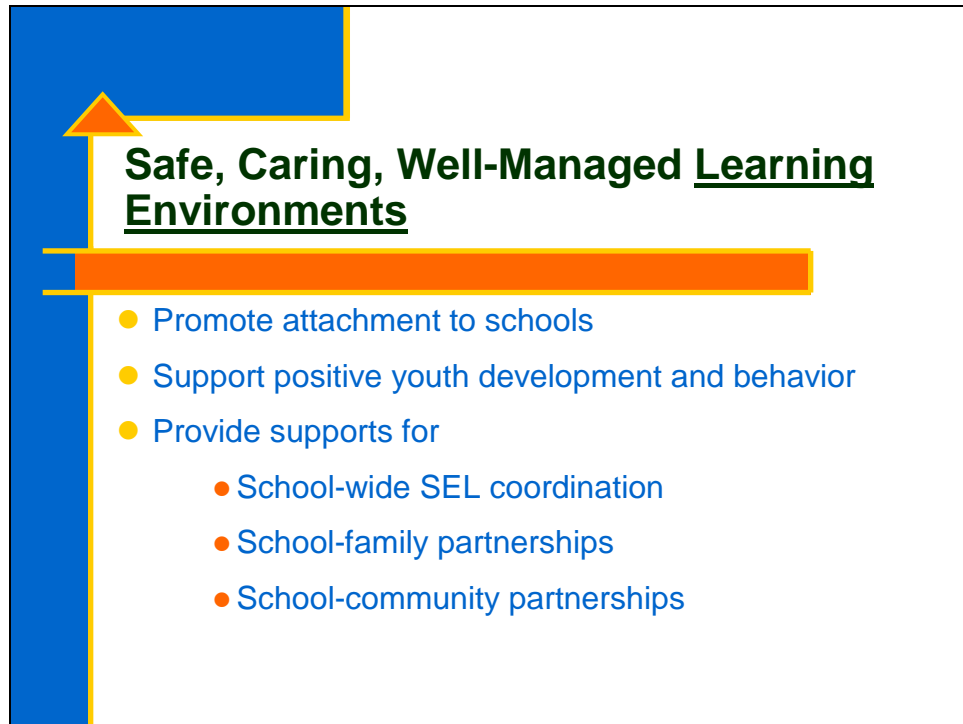


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(CASEL, 2003)

Now, here's just a little elaboration on what I mean by these SEL competencies. Self-awareness---we're talking about knowing what we're feeling at the moment, having a realistic assessment of our own abilities, and a well grounded sense of self-confidence. Social awareness refers to understanding what others are feeling, being able to take their perspective, appreciating and interacting positively with diverse groups. Responsible decision making---making decisions based on an accurate consideration of all relevant factors, the likely consequences of alternative courses of action, respecting others, taking responsibility for one's actions and decisions. Self-management refers to handling our emotions so they facilitate rather than interfere with the task at hand, being conscientious in delaying gratification to pursue goals, persevering in the face of setbacks and frustrations. With the last one, relationship skills, we're talking about handling emotions in relationships effectively, establishing and maintaining healthy and rewarding relationships that are based on cooperation, resisting inappropriate social pressure, negotiating solutions to conflict, seeking help when it's needed. So that's what we mean by the competencies. Effective SEL programs should teach all these key competencies.



## **Safe, Caring, Well-Managed Learning Environments**

- Promote attachment to schools
- Support positive youth development and behavior
- Provide supports for
  - School-wide SEL coordination
  - School-family partnerships
  - School-community partnerships

Another aspect of the SEL programming model is that SEL instruction needs to take place within a safe, caring, well managed learning environment. These environments ought to promote attachment to school, bonding to the family and community. Schools often use activities like service learning and community service to help promote attachment and bonding, and they've become a very popular. As a result, kids are providing service to their schools and families. They're providing it in their communities, to their churches and synagogues and just generally promoting the common good, which is helping them to develop the skills we're talking about. These learning environments also support positive youth development and help with school-wide SEL coordination. So again, as I said earlier with the schoolhouse, these activities and programs are all integrated and coordinated with one another. School-family-community partnerships are very important, as responsibility for helping kids dealing with the many challenges confronting them is not just the school's problem. Schools get blamed for many of these ills, but it's a societal problem. It's something that our communities need to deal with too, rather than only the schools. We need these school-community partnerships and we must involve families in SEL interventions too, if we're to be effective.



## Application: Targets of Intervention

- All Students at All Grade Levels
- Students at Risk
- Students Experiencing Significant Problems
- Significant Adults (e.g., teachers, parents)
- School Climate and Organization
- Community

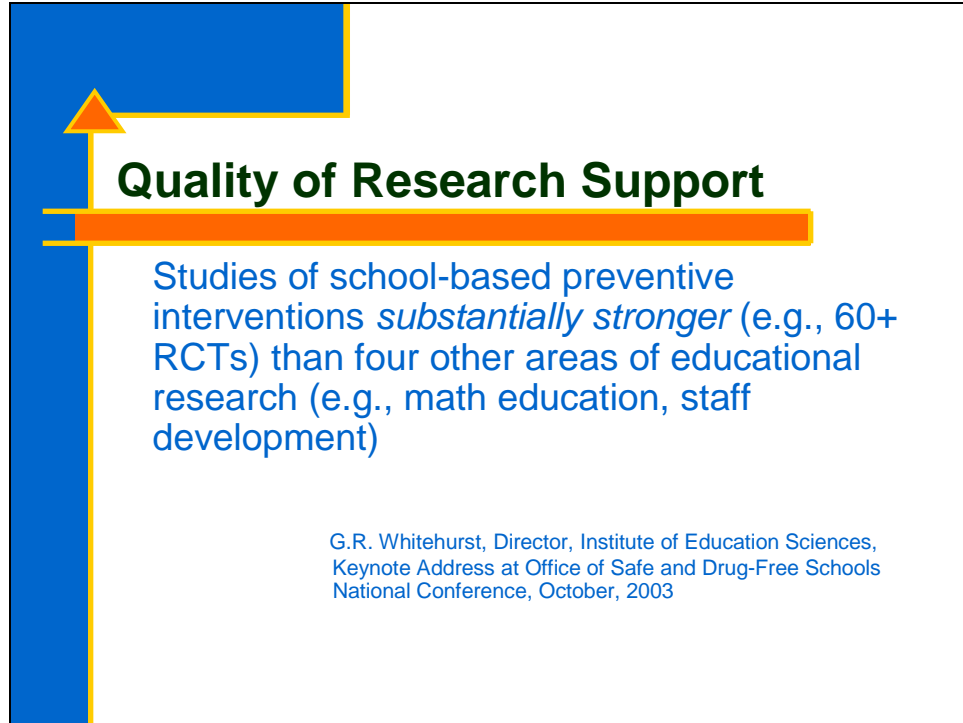
There are different targets for our interventions; generally speaking, SEL programs are directed at all students at all grade levels, so we're talking about a universal preventive intervention. The important point is that we're viewing these issues from a preventive and promotion point of view ---we're trying to prevent kids from having problems. And, we're promoting various competencies like problem solving and social awareness, as I said earlier. All kids can benefit from these efforts.

There's another group of kids, a smaller one, who need something a little bit more and a little bit different. These are the kids at risk, who might be at risk because they live in poverty, or they have some learning deficits, or whatever it might be, but they're kids who are at risk for developing maladaptive behaviors. And finally, there's another even smaller group of kids who are experiencing significant problems who need direct treatment such as counseling or medication.

We also need to address the adults who are involved with the kids. When teachers are teaching these SEL topics, they tend to apply these concepts to their own lives too. As far as I'm aware right now, no one has done a study where they've tried to look at how teachers improve their social and emotional competence when they're teaching this, but it seems clear to me that there's probably some relationship there. Teachers who address these topics most likely apply the ideas to themselves. And, as previously mentioned, we can also focus on the school climate and organization, as well as relevant aspects in the community. So we target all those different areas as we're developing SEL programs.



So, the big question is, does it work? I was in Washington recently for a Safe and Drug-Free Schools conference and the director of the Institute for Education Sciences gave a keynote address. It was the fifth one he had done in a short time. He had talked to the math educators, and the staff development people, and others, and he said he was pretty skeptical when he came to speak with these Safe and Drug-Free Schools folks as he considered whether these prevention programs worked. When he reviewed the research, he came to a conclusion. He said, "Now there's a lot of work you still need to do," and I'd be remiss if I don't say that, because there is much that remains to be done.



**Quality of Research Support**

Studies of school-based preventive interventions *substantially stronger* (e.g., 60+ RCTs) than four other areas of educational research (e.g., math education, staff development)

G.R. Whitehurst, Director, Institute of Education Sciences,  
Keynote Address at Office of Safe and Drug-Free Schools  
National Conference, October, 2003

“But compared to these other four areas I reviewed, the research support in school-based preventive interventions was substantially stronger.” I thought that was pretty strong support coming from someone in his position.



## Examples of Research Support for Effective SEL Instructional Practices

- School Preventive Intervention Studies
- Mental Health and Positive Youth Development Studies
- Substance Abuse Prevention Studies

To understand effective SEL instructional strategies, what I want to do instead of going through all the different studies, is look at a couple of reviews and meta-analyses where they've gone and looked at this area from different perspectives. I wrote about this in a paper with Mark Greenberg and other CASEL colleagues.

One of the first things you find is that people call these concepts by many different names. You'll find this research under a lot of different topical areas. As you can see, there are the school-based preventive intervention studies, the studies of mental health and positive youth development, substance abuse. I just picked out a couple of the major reviews and meta-analyses, and I'll just mention which ones those are, and then I'll describe some of the major outcomes. You'll find that when you read these studies, there are a lot of similarities in outcomes that are reported.



## **School Preventive Intervention Studies**

Wilson et al. (2001) conducted meta-analysis of 165 studies ranging from individually-focused (e.g., counseling, mentoring) to broad environmentally-focused (e.g., school-wide) interventions

For example, Wilson, Denise Gottfredson, and colleagues did a meta-analysis of 165 studies of what they called school preventive interventions. These ranged from those that are individually focused to broader, system-wide interventions.



## **Mental Health and Positive Youth Development Studies**

Greenberg et al. (2001) reviewed 130 rigorously evaluated studies of universal, selected, or indicated prevention programs directed to reduce aggression, depression, anxiety, etc, or positively influence factors associated with risk for disorders

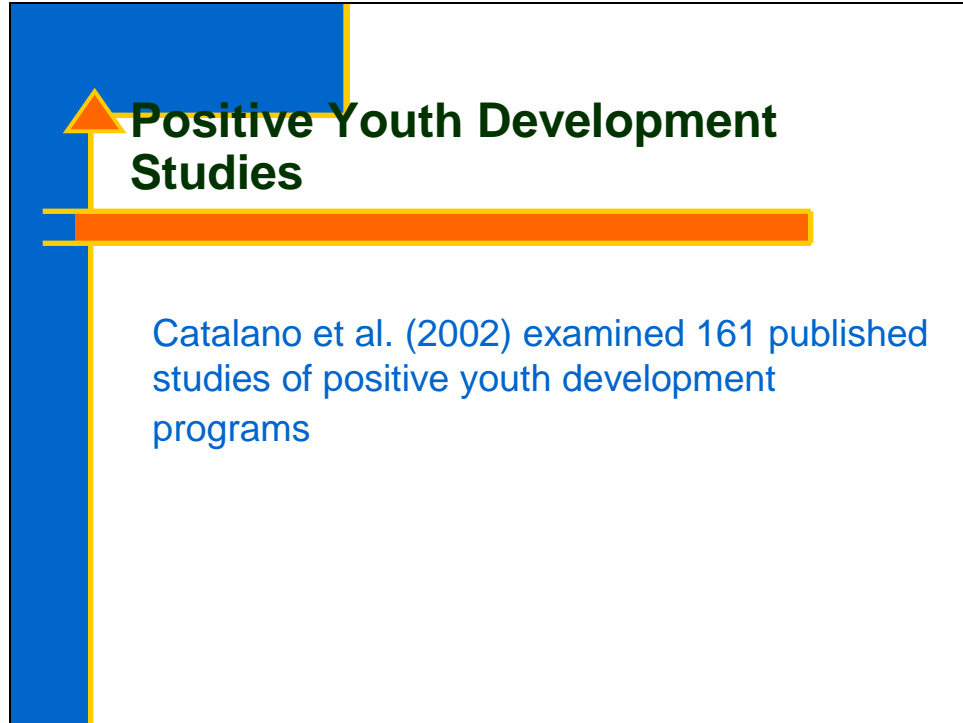
In mental health and positive youth development, Mark Greenberg reviewed 130, rigorously evaluated studies of universal selective and indicated prevention programs directed toward aggression, depression, and similar areas.



## **Mental Health Studies (cont.)**

Durlak and Wells (1997) conducted meta-analysis of 177 studies of primary prevention programs to decrease behavioral and social problems in youth

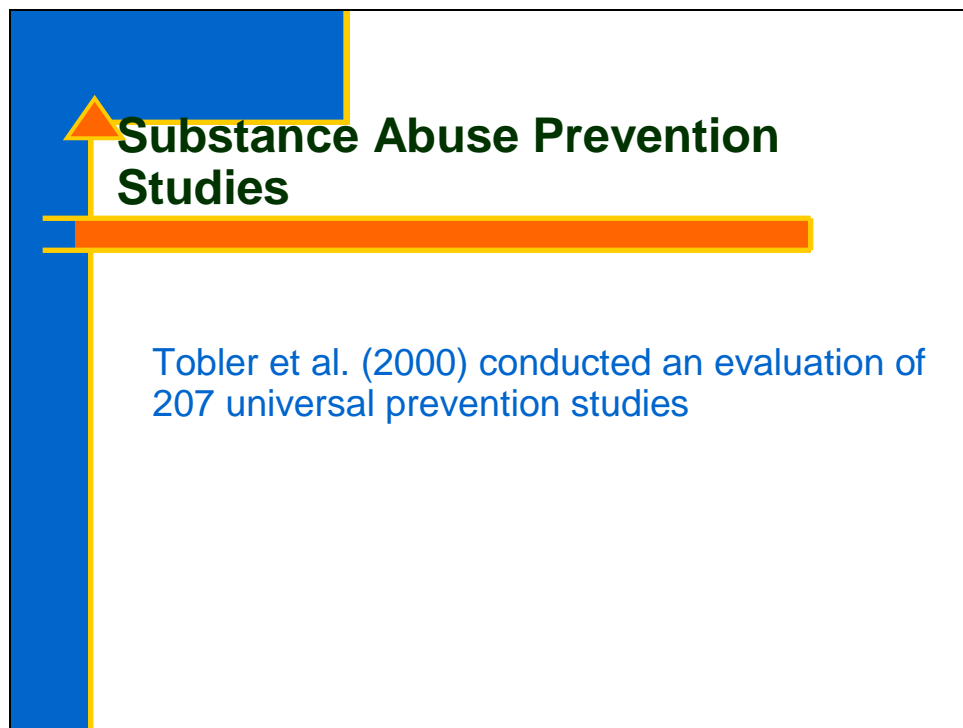
Joe Durlak and Wells looked at mental health outcomes and did a meta-analysis of 177 primary prevention studies designed to decrease behavioral and social problems in kids.



**Positive Youth Development Studies**

Catalano et al. (2002) examined 161 published studies of positive youth development programs

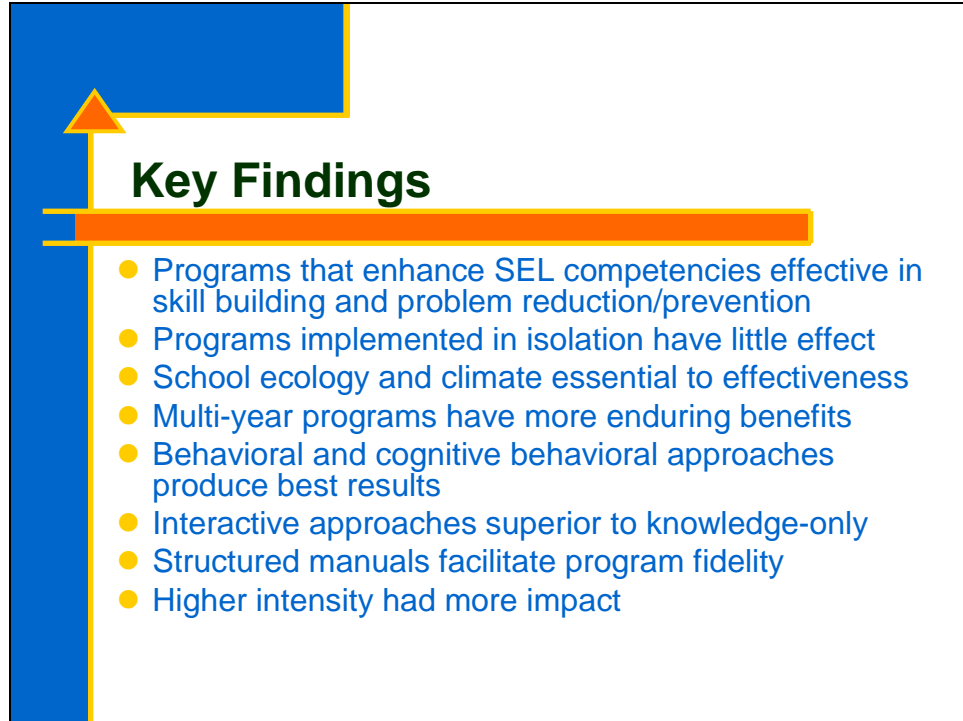
Rico Catalao and his colleagues in the Social Development Research Group in Seattle examined 161 studies of what they call positive youth development.



## Substance Abuse Prevention Studies

Tobler et al. (2000) conducted an evaluation of 207 universal prevention studies

There's a long list of substance abuse prevention programs that have been around for a long time, and Nancy Tobler and her colleagues conducted an evaluation of 207 of these universal prevention studies.



## Key Findings

- Programs that enhance SEL competencies effective in skill building and problem reduction/prevention
- Programs implemented in isolation have little effect
- School ecology and climate essential to effectiveness
- Multi-year programs have more enduring benefits
- Behavioral and cognitive behavioral approaches produce best results
- Interactive approaches superior to knowledge-only
- Structured manuals facilitate program fidelity
- Higher intensity had more impact

Clearly, there have been a lot of studies done in areas related to social and emotional learning. By citing these articles I have tried to summarize the characteristics of interventions that can be effective in producing SEL-related results.

Among the findings that are real interesting is that these programs implemented in isolation have little effect. So going back to our schoolhouse, you can't just implement these programs by themselves. They've got to be integrated and coordinated across the whole curriculum in school, and with family and community involvement. School ecology and climate are essential. Those that don't involve parents aren't as effective. Similarly, multi-year programs have more enduring effects. Therefore, we'd like to see SEL instruction provided from pre-kindergarten through grade 12 so the kids are get these messages reinforced across their whole school career.



## Key Findings

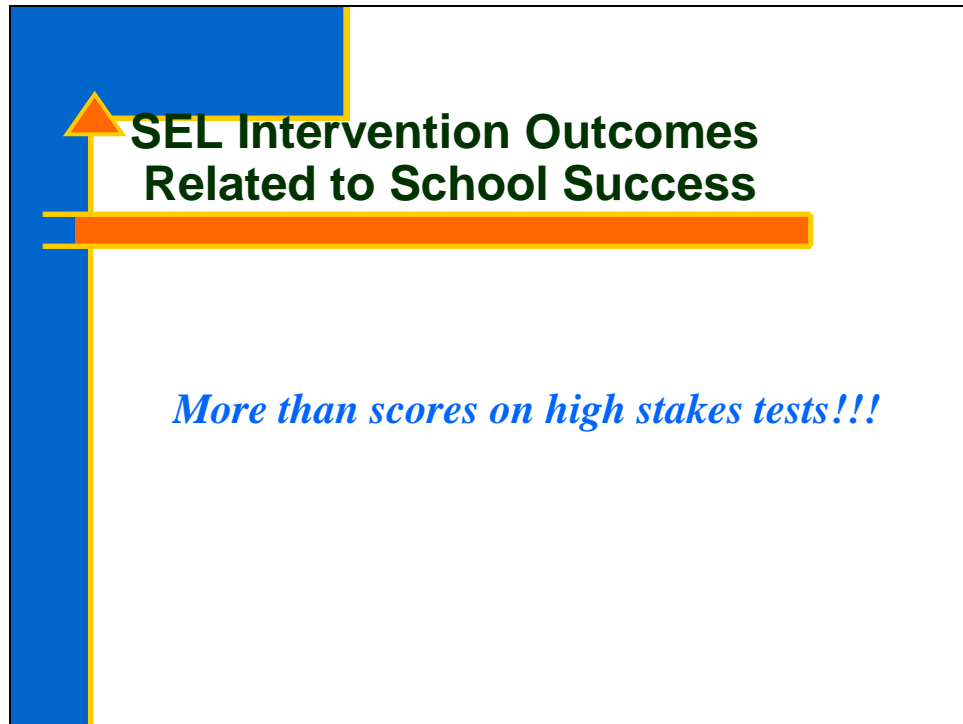
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Behavioral and cognitive behavioral approaches seem to produce the best results. Those aren't the only approaches that work, but they consistently are shown to be effective. And, interactive approaches are superior to knowledge only techniques, which I mentioned before.

Structured manuals facilitate program fidelity. We're doing a lot of work in the area of program implementation and looking at sustainability factors because we don't want to see programs get adopted and then in a couple of years when the next fad comes along, find that they get dropped as they off into the next thing. Schools are constantly temped with new initiatives. Program developers are pounding on their doors offering the latest solution for everything in the world.

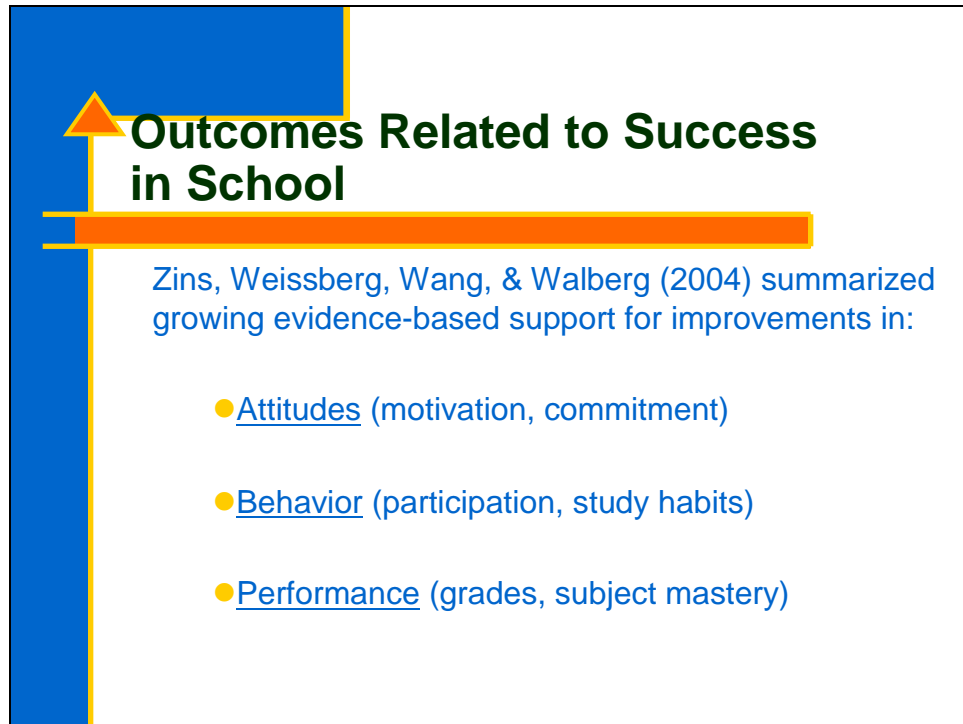
And finally, the higher intensity programs where they meet more frequently seem to have more impact than lower intensity ones.

In each of these reviews the authors emphasized that there are many ways in which the field can be improved, giving examples of things that need to be worked on, questions for which we don't have answers, and so forth. Although they reported many positive aspects, they weren't simply saying that instructional techniques in this field are working extremely well, that those in the field are simply going to live happily ever after.



What I want to talk next are SEL intervention outcomes related to school success. I've been involved with SEL interventions for a long time, and to me it's easy to wonder why doesn't everybody want to do such work? It just seems so evident that these are the kinds of things we should do to help kids. But teachers and school administrators and the public are concerned about multiple aspects of schooling. They have many pressures such as preparing their students for the high stakes tests. These educators tell us, "We simply can't do everything. We've got to prepare to students for the next proficiency test," or for whatever it might be. And so when we go into schools and suggest, "You need to do teach SEL. This material is really important." They respond, "Sure, but we have to teach these other areas, prepare them for such and such test."

As a result, in the last few years we began looking at outcomes related to success in school, which as the slide says, it's more than scores on high-stakes tests. Now I'm not going to minimize the importance of teachers preparing students for these tests, because they need to do so. But what we must remember is that SEL instruction is also closely related to kids doing well on high-stakes tests. To demonstrate that point, I'm going to talk about some studies that have been done regarding outcomes related to school success.



## Outcomes Related to Success in School

Zins, Weissberg, Wang, & Walberg (2004) summarized growing evidence-based support for improvements in:

- Attitudes (motivation, commitment)
- Behavior (participation, study habits)
- Performance (grades, subject mastery)

One additional thing I should mention is a publication from CASEL (holds up copy). It's called *Safe and Sound: An Educational Leader's Guide to Evidence-Based Social and Emotional Learning Programs*, that reviews and rates SEL programs. To begin, CASEL identified about 300 SEL programs available nationally which potentially could be included in the review. They found about 80 programs that met certain criteria for inclusion, and then rated each of them. In this booklet are ratings across a number of key dimensions, many of which I'm mentioning. The best programs were identified as Select. A number of organizations have done similar ratings. A big problem for program implementers is the sheer volume of programs available and how to make decisions on which to use. So, these ratings are very helpful to them in making choices.

To get back to outcomes related to school success, I'm going to talk about a program from Mark Greenberg called PATHS---that's Promoting Alternative Thinking Strategies. Maurice Elias developed Social Problem Solving and Social Decision Making. David Hawkins at University of Washington has the Seattle Social Development Program. Eric Schaps in Oakland, California, is involved with the Child Development Program. Roger and David Johnson at Minnesota are involved with Cooperative Learning. Those are the primary programs that I'm going to mention with respect school success, and these findings are based on work that I did with Roger Weissberg and Herb Walberg.

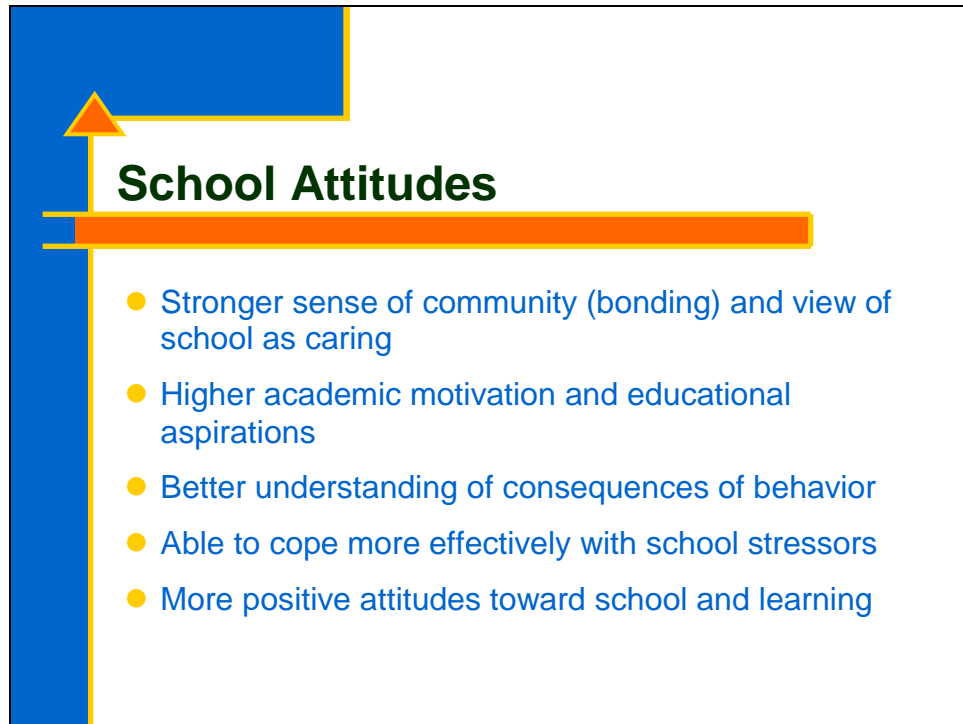


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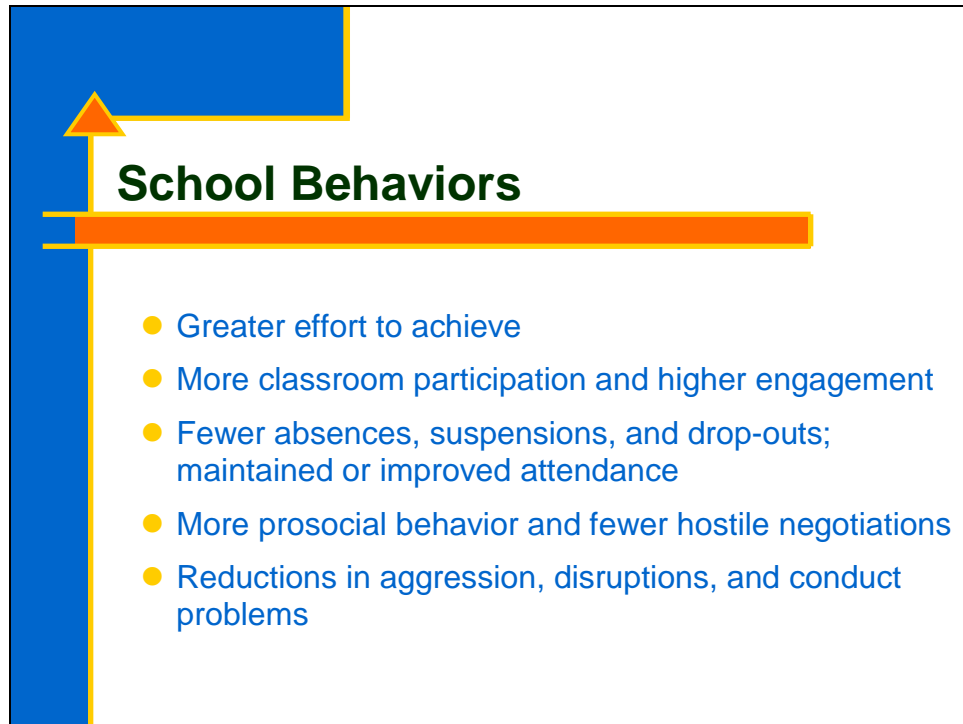
As we examined the field, we organized outcomes into three categories: attitudes, that is, motivation and commitment; school behavior, which includes participation and study habits; and performance—grades and subject mastery. Again, we did not want to look at outcomes based solely on these tests, but thought broadly about why kids are successful in school.



## School Attitudes

- Stronger sense of community (bonding) and view of school as caring
- Higher academic motivation and educational aspirations
- Better understanding of consequences of behavior
- Able to cope more effectively with school stressors
- More positive attitudes toward school and learning

In terms of school attitudes, what was found in these studies, for instance, is that kids in SEL programs have a stronger sense of community. They view schools as caring. They have greater trust and respect for their teachers and they have higher academic motivation, better understanding of the consequences of their behavior. There are many attitudinal aspects being changed in these SEL programs. They also coped more effectively with school stressors and had more positive attitudes toward school learning. As you can see, these are good outcomes in terms of school success.



## School Behaviors

- Greater effort to achieve
- More classroom participation and higher engagement
- Fewer absences, suspensions, and drop-outs; maintained or improved attendance
- More prosocial behavior and fewer hostile negotiations
- Reductions in aggression, disruptions, and conduct problems

Another area we looked at is school behaviors. Following SEL interventions, participants were exerting more effort to achieve, participating more in class. They were also more engaged in their classroom, participating in class discussions and class activities. You'll also see fewer absences and suspensions—they're important because if the kids aren't there, they're not going to learn. More prosocial behavior and fewer hostile negotiations were also found. By learning the appropriate skills, when the students get into a hassle on the playground or at lunch, they can deal with the matter successfully. You'll also note reductions in aggression, disruptions, and conduct problems. Also, there are many studies demonstrating less use of drugs, alcohol, and tobacco, and that they're engaging in more positive activities. You also may be more likely to find these kids more involved in sports or other extracurricular activities.



## School Performance

- Improved math, language arts, and social studies skills
- Increases in performance over time (elementary to middle school)
- Higher achievement test scores and/or grades; no decreases in standardized test scores
- Better problem solving and planning
- More use of higher level reasoning strategies; improved non-verbal reasoning

In terms of school performance, there are increasing indicators that students who go through SEL programs have improved skills in math, language, art, social studies. Some of these studies have even been done with kids in special education---for instance, children who are deaf have shown improvements in their reading skills. There are many other interesting findings, such as Eric Schapps found that those in his intervention during elementary school saw no differences in academic achievement, but once they hit middle school, they made improvements, so it looks like it took a while until the effects kicked in. One of the other outcomes I like is that the lack of decreases in standardized test scores, because people express concerned that, "Well, if we spend time on SEL, we can't do all the academic things we need." So the fact that they're not decreasing is also informative.



## Conclusion

*“There is convincing evidence that the knowledge base now exists indicating that certain methods of classroom instruction, management, practice, and climate can enhance school success and promote social and emotional competence.”*

*Zins et al., 2004*

From all the studies that we've looked at, I have to say that SEL interventions are not a panacea. They're not the answer to all the different problems that we have in schools or in society. But for any educational reform we have, including SEL instruction is an important component. What we concluded following our extensive review is that there's convincing evidence that the knowledge base now exists indicating that certain methods of classroom instruction, management, practice, and climate can enhance school success and promote social and emotional competence.

## Proceedings from the ETS & ARI Emotional Intelligence Workshop

Session V: Applications



*“Working to establish social and emotional learning as an essential part of education from preschool through high school”*

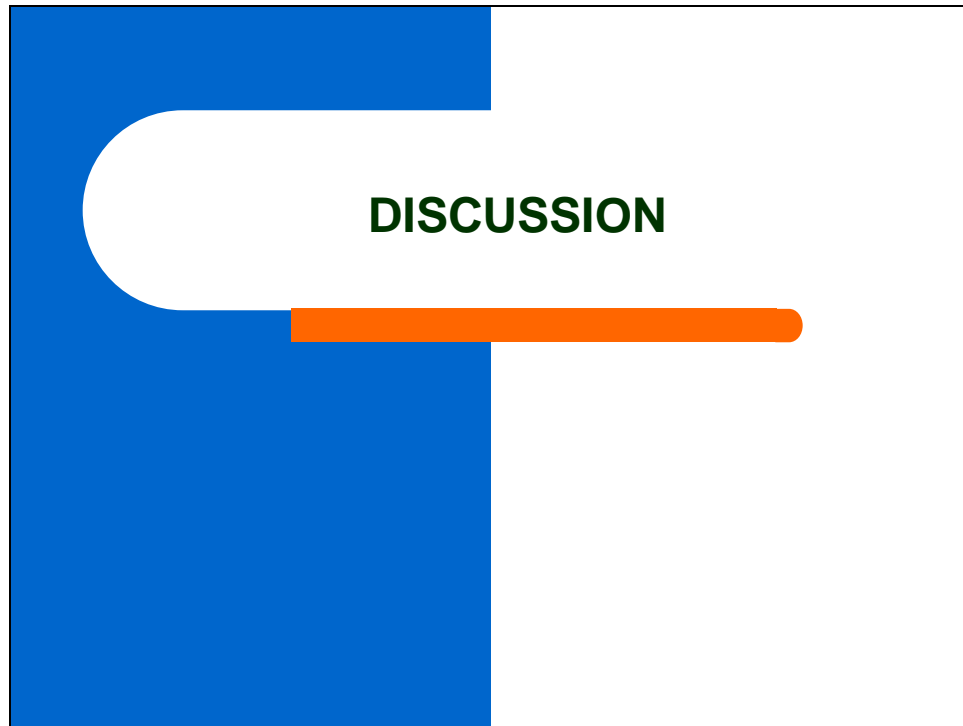
**For updates on research and practical advice for educational leaders, teachers, parents, & others, please visit our web site**

**[www.CASEL.org](http://www.CASEL.org)**

One final thing I want to say is that much of what I've presented is related to my work through the Collaborative for Academic Social and Emotional Learning. That's our website (points). The vast majority of the research that I've referenced can be found on our website or I can provide that for you. The website contains many other helpful materials for teachers, for administrators, for researchers, to try to promote and improve SEL practices in the schools.

Now I'm at the end of my presentation, and Gerry should be happy that I finished on time!

Thank you.

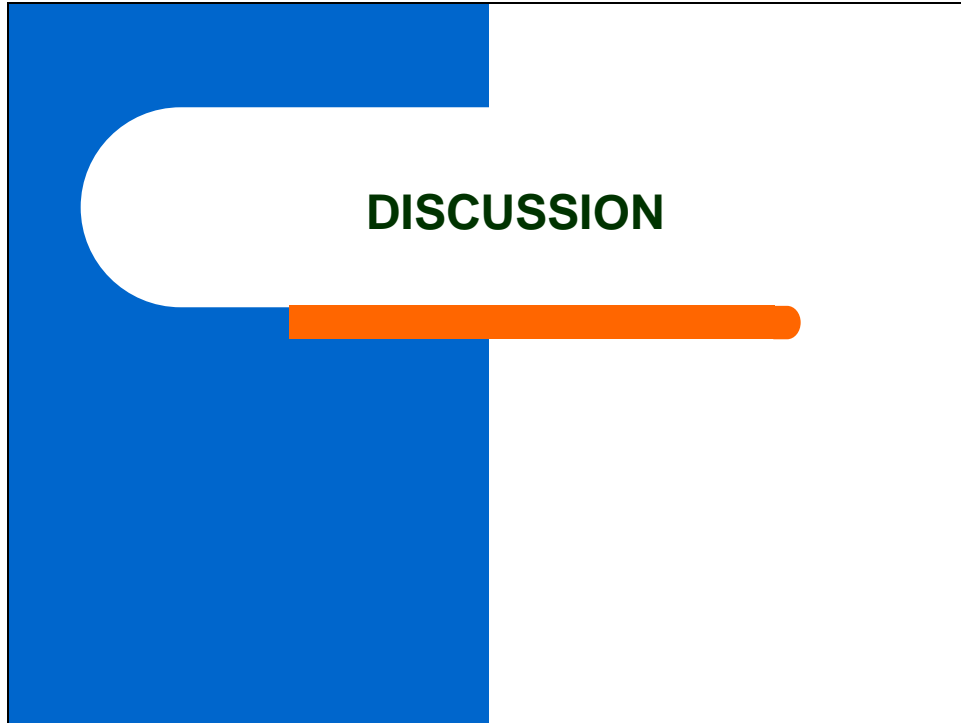


## DISCUSSION

**DR. MATTHEWS:** We have time for questions.

**DR. MAYER:** First, I'm very appreciative. I know that you and your colleagues have brought the level of research and educational intervention programs tremendously forward from the mid-'90s to today, and it's great to see all these results. As I've been looking at some of the educational curricula and so forth, and this may be a misunderstanding of how the field works, but I'm curious about an area that maybe you covered and maybe you didn't. What about character education? Is there still a sort of a political slip between SEL and Character Education? Do the Character Education people have their own outcome studies? Are they the same thing really?

**DR. ZINS:** What you're bringing up demonstrates the confusion we have about what to call these efforts. I mentioned positive youth development as another group. There's also emotional intelligence and school mental health and character education. Character Education is a big organization. In my opinion there's more of the scientific basis of practice coming out of the SEL field than there is out of Character Education. They've been very influential in terms of getting funding for these kinds of interventions. Here in the state of New Jersey there's a big initiative on Character Education, so they're very active and we work with them. Our executive director sits on their board and we have a lot of interactions between our organizations.



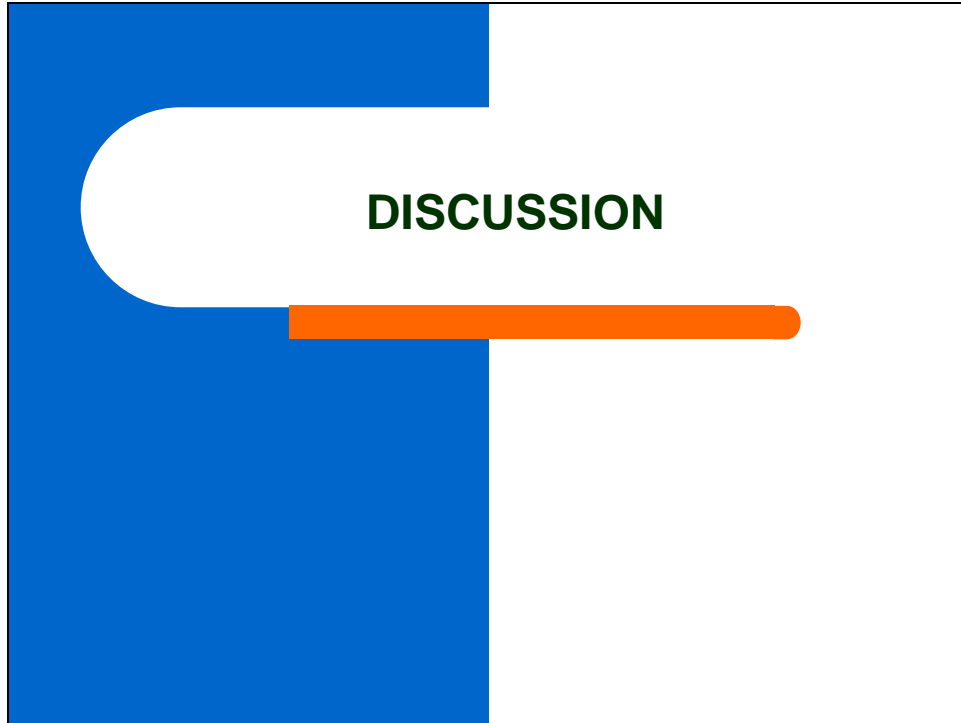
**DR. MAYER:** Do the reviews cover the Character Education programs?

**DR. ZINS:** It depends on how you categorize these concepts. For instance, I mentioned Eric Schapps' work as part of SEL. He's on the Character Education board and active in that group. So there's a lot of overlap and I don't like to think of these things as being that discrepant from one another, because they really have so much in common.

**DR. KYLLONEN:** I have a two-part question. From the findings slide it seemed that there were two categories of findings. One was that basically the more you did the better the outcome – intensity and so forth.

**DR. ZINS:** Yes, to a great extent.

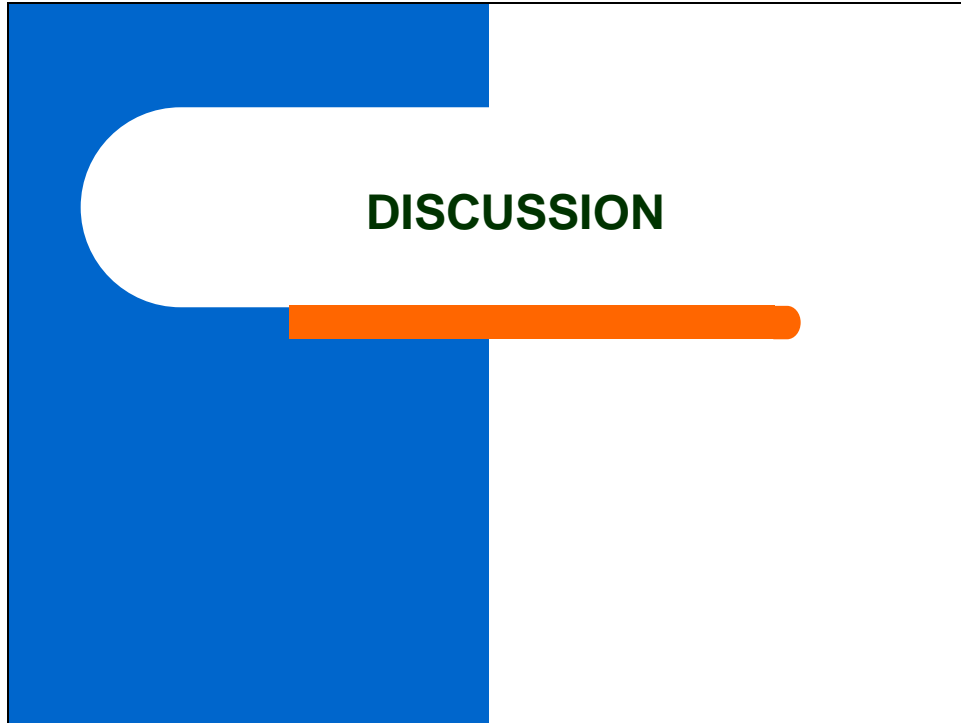
**DR. KYLLONEN:** And then there was one other finding that was something about cognitive and behavioral being more effective and I didn't know exactly what that meant? What was contrasted with cognitive and behavioral? And then going back to the first part of the question, given that the more you do the better, you are basically, it seems like you have a lot of data here, a lot of information, a lot of studies. It might be useful to do a cost study, so that there's kind of a bang-for-the-buck kind of issue that you could sort out. You know, it's certainly the case that the more you do the more you get, but how much does it cost to do these various things?



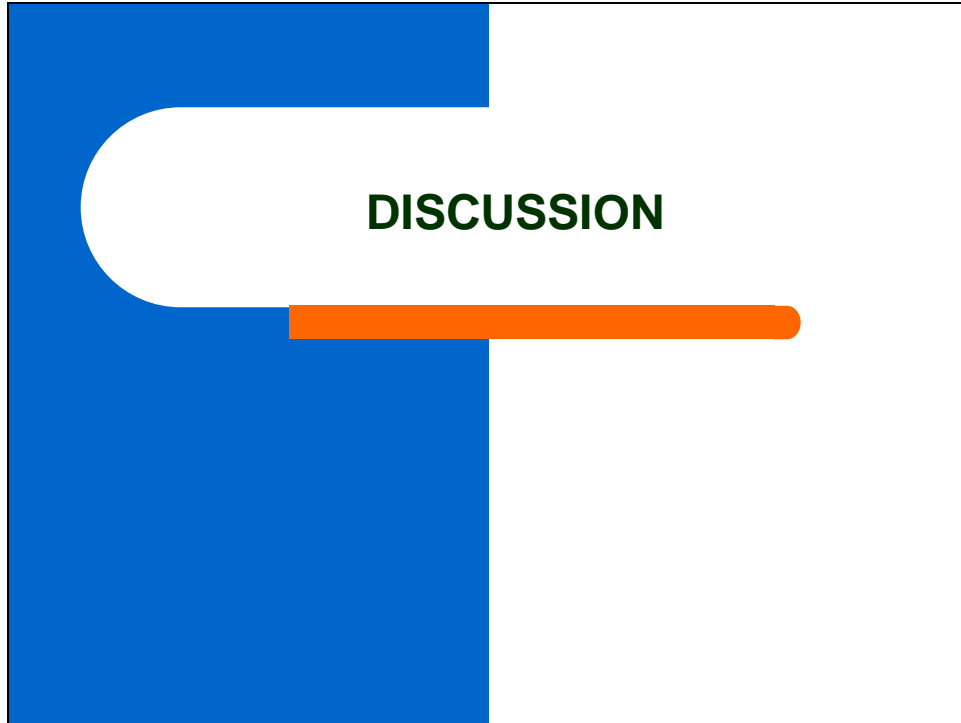
**DR. ZINS:** You're 100% correct and I know one of the things that we haven't talked about is how many lessons you have to do in terms of cost effectiveness, and my colleagues and I have talked about those issues with respect to implementation and sustainability. If we want to ensure high implementation we can; there are so many things you can do, but at what point is it no longer worth it, as you pointed out so clearly? And those studies haven't been done, and I haven't seen anyone who's done the analysis that you're talking about. In terms of the more is better, there are some limitations on that finding. But I would contrast it with people who are doing lessons over the course of a month versus doing it over the course of the year or years, or doing something once a month versus doing it every day. There's some ideal limit to how much you can do but I don't know the exact answer to that.

**DR. KYLLONEN:** With respect to the cognitive and behavioral versus other, what is other?

**DR. ZINS:** Well, they were talking about like using other approaches than cognitive behavioral skills training like in counseling and social work therapeutic types of interventions.

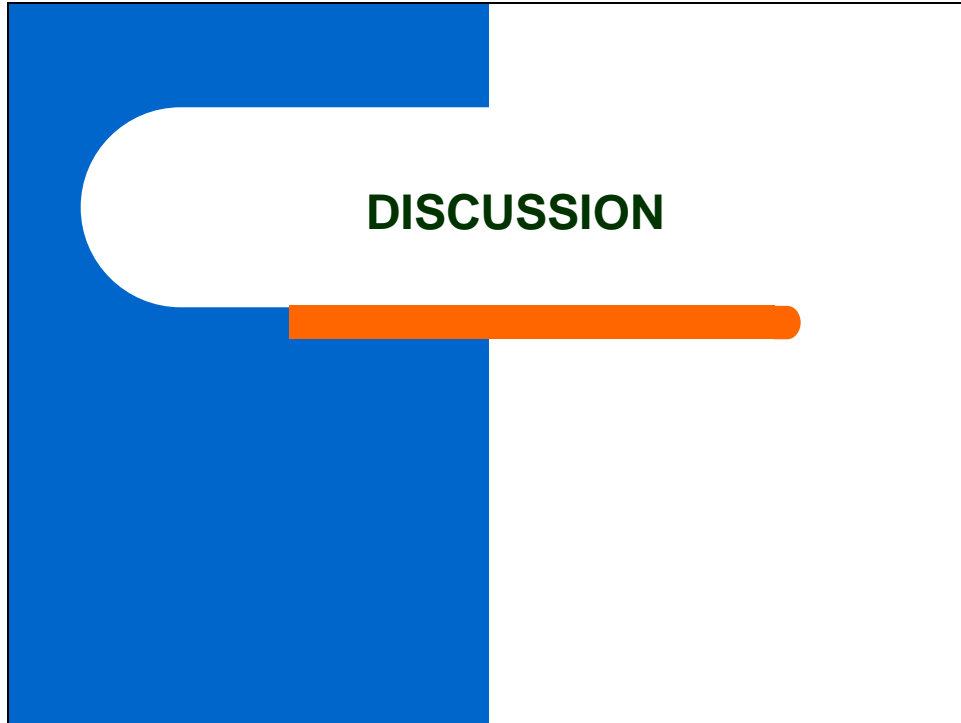


**DR. ZEIDNER:** Recently we did a review of EI programs, intervention programs for educational psychologists, and what was surprising is that actually there were few EI programs to review. There were SEL programs to a large extent, some of them dealing with violence prevention, drug prevention, pregnancy reduction, and so forth and so on. To do a review of an EI program, you have to have a program that's based on a conceptual model of the type of components that are contained under EI. You have to make sure you have good measures, valid measures for each of these components. You have to make sure that they're implemented within the school system and evaluated accordingly. Aside from maybe Greenberg's PATH, there are actually very few EI programs out there. So the question is whether you; you may be familiar with new programs that are based on clear conceptual models that are actually being implemented. And with respect to implementation, I just wanted to note that from within these (I just did a review of a large SEL program there), there are little effects with respect to reduction of aggression. And when I looked at the implementation, the teachers were not implementing these programs according to the specifications and that was a major problem. I think that these types of programs should not be contained, should not be implemented separately as self-contained programs. They should actually be integrated across the curricula over the years. I want to see anxiety management taught in math classes where there's a lot of frustration with respect to math, empathy in literature, and so forth and so on.



**DR. ZINS:** Yes. Those are good points you're bringing up. Again, if I refer back to Eric Schapps, he has lists of various books for classes that can be used at all different grade levels and the SEL lessons are there. We just have to talk about those elements of our literature and history and so forth.

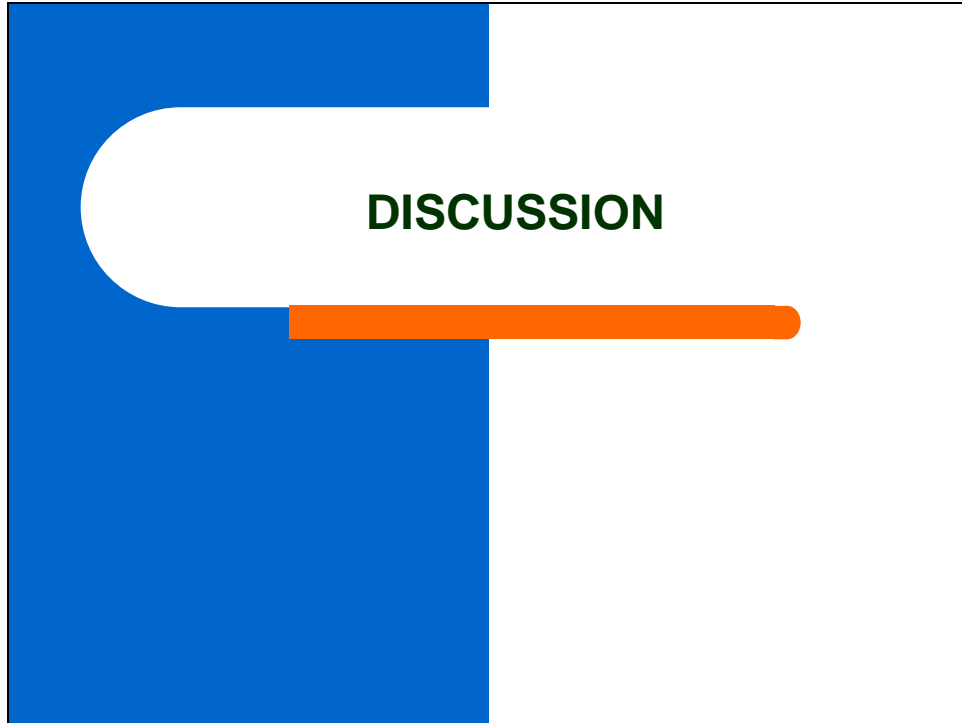
I hear kids in school complaining that, "You know I had a history test and my teacher took off because the sentence structure was not very good or I misspelled things." When kids are doing an essay in history, do we expect them to write properly? I think we do. We want them to use good grammar and express themselves clearly. So we integrate everything else across the curriculum. Why shouldn't we do this with SEL? Related to the other thing you were talking about, we have a book listed in the bibliography. It's called *Promoting Social and Emotional Learning* that we've gotten out to almost 120,000 educators that was published in 1997. In that book we have a list of 37 guidelines for delivering SEL programs. The first one we have in there is having a good model, a good theoretical model on which the program is based.



**DR. ZINS (CONT'D):** The book contains our whole overview of SEL along with our 37 guidelines. With respect to implementation, we explored that topic in detail in two conferences at Penn State dealing with implementation and sustainability issues. Out of those meetings we published two issues of the *Journal of Educational and Psychological Consultation* that discuss implementation of prevention programs and measuring the quality of implementation, because they're so important. And, I produced with Mark Greenberg and colleagues a SAMPSA paper that if they ever release it, contains a model of implementation of prevention programs. It contains a complete model and everything you want to know about implementation. But you're correct, it's a big issue. Many times in schools they're not addressing that issue, and as a result we then have a black box and don't know what happens.

**DR. MATTHEWS:** One last question.

**PARTICIPANT:** What information do you have, if any, that's available on the contribution made to SEL by things such as arts education, physical education, foreign language education, and extracurricular activities in an educational setting?



**DR. ZINS:** The only one I'm aware of is in the extracurricular where kids are involved in more such activities. I don't know about the other areas, but it seems like they should be related. There may be somebody who's done that, but I'm not familiar with the work, and we definitely ought to be linking into those other areas too.

## Emotions in the Workplace



Ruth Kanfer  
Georgia Institute of Technology  
Atlanta, GA

### EMOTIONS IN THE WORKPLACE

**DR. KANFER:** The topic that I'm going to address today is emotions in the workplace and it's very fitting after the last talk. Children grow up and show up in the workplace as adults, and the effectiveness of these programs presumably has an impact on the effectiveness of performance in the workplace. But there's a lot of things about the workplace that are different from a school environment. The first is that, and if you remember the first cartoon, there is diversity in the workplace, but it's a different kind of diversity. The movement from school to work is a movement where in fact there's very much a self-selection process going on. People gravitate to and obtain positions in the workplace that fit their intellectual and social competencies and interests. So we have some situational selection taking place before we even look at that sample in the workplace.

The second is that the workplace is diverse also in terms of gender and age in a way that is different, in part because of attrition and other factors, from the school. In this country, for example, we're currently dealing with a workplace that is aging in a way that hasn't been observed for almost a century. And, in terms of looking at emotions in the workplace, that creates a set of issues in and of itself, but I believe Derek will talk about the implications of, so I'll just touch upon, aging and looking at continuity.

## Emotions in the Workplace



Ruth Kanfer  
Georgia Institute of Technology  
Atlanta, GA

The third difference from school settings is that you don't graduate from work. And as Freud notes, "work is with you for life in some form." And so are emotions and affect, and these really represent as, and I've heard the term before, the approach, and what one chooses, and how one approaches work, and the emotions that are experienced in that context are really very much the human dimension.

Work is arguably the principle stage for adult accomplishments and the satisfaction of very basic motives relating to achievement, to affiliation, to power, to most of the things that adults seek throughout their life. Work is the principle place where it happens. People typically work now four or more decades. Although the trend has been for the retirement age to gradually decline, economics may stall or reverse this decline. But the bottom line is that people are active in the work environment for a very long time.

Finally there's this notion that the workplace is saturated with affect and emotion. Now there are a lot of perspectives on this. You can talk about the influence of emotions, and emotional episodes and emotional events in terms of training and learning, just as you might talk about it in the education domain. In addition, however you can discuss affect and emotions related to decision making in terms of events that are uniquely work related – job loss, survivor layoffs, career barriers.

## Emotions in the Workplace



Ruth Kanfer  
Georgia Institute of Technology  
Atlanta, GA

You can talk about affect saturation in terms of events that unfold over time and events that are very sudden, events that are expected, events that are not expected, and in terms of a number of different emotions which may be described in dimensional terms and may be described in relational terms.

The purposes of my comments today are twofold. The first is to give a very brief history of the study of work affect and emotions in industrial organizational psychology. That's the area that I work in, along with issues of self-regulation and identifying other non-cognitive determinants of work performance. Second, I will discuss three contemporary themes and then focus in on this issue of emotion regulation, arguing that emotion regulation represents the practical interface between emotional life and performance. Finally, I will discuss some implications and invite questions.

I guess one of the first things that I want to say is that there's good news and there's bad news with respect to the study of work affect in organizations. The good news is that there is a great deal of activity going on in the field and a number of promising directions. You heard one of them yesterday in terms of Alicia's work on emotional labor. The bad news is that it comes after a real period of drought. So, in some ways it's very surprising that emotions in work life have not been more thoroughly studied, and some of the prior work may seem somewhat simplistic.



## Workplace concerns

- Preventing inappropriate emotion-related behaviors (e.g., aggression, anger, incivility)
- Minimizing emotion-related mental or physical health problems (e.g., exhaustion, stress)
- Promoting appropriate emotion-related behaviors (e.g., work motivation, helping, teamwork, commitment, satisfaction)
- Selection and training of leaders/managers to facilitate team productivity, job dedication, and social relations

Organization needs often shape contemporary interest in the impact of emotion with performance. Generally, organizations have four primary concerns. They want to prevent inappropriate emotion-related behaviors and I think you've heard about all these and it's pretty obvious. They want to promote appropriate emotion-related behaviors that are associated with motivation, helping, and teamwork at multiple levels – at the individual level, in the team, and at the organizational level. They want to minimize emotion-related mental or physical health problems, since this is becoming a more important issue over time as organizations pay the cost for these kinds of problems. And they want to select and train leaders and managers to facilitate team productivity, job dedication and social relations, because of the changing nature of the workplace. Although this has always been an issue, it's even more an issue today.



## Defining the problem space

### Determinants of emotion:

- Person (intellective/personality) influences
- Work environment influences
  - Job characteristics
  - Socio-emotional work role demands
- Exogenous factors (e.g., mood cycles, home factors)

The topic of affect and emotion is a huge area and I guess the first thing that one needs to do is to define the problem's space in a way that you can deal with it. So, I will do so very simplistically by providing an overview of some of the things we've talked about in the last two days. We can talk about person influences in terms of intellect versus personality encompassing both affect and motivation. We can talk about the environmental influences in terms of characteristics of the job, both socio-affective as well as structural. And then we can talk about the demands of the work role and the socio-emotional demands of the work role, which can be distinctly separated from the characteristics of the job. And then we can talk about exogenous factors, mood cycles, home factors and so on, with all of these historical contributions conceptualized as main effects as well as complex interaction effects at different times for different people.



## Defining the Problem Space (continued)

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### Emotion-relevant processes

- Event Appraisal → emotion generation
- The dynamics governing intensity of felt emotions
- Regulation of emotion-related behaviors

Then there are a set of emotional-relevant processes, and there's been a lot of discussion about these processes; event appraisal, the generation of the emotion, the dynamics that cover the specificity and the intensity of the felt emotions, and the regulation of emotion-related behavior and emotions.



## Defining the Problem Space (continued)

### Criterion/outcomes:

- Affect-driven work behaviors  
e.g., helping, absenteeism, coping
- Work attitudes  
e.g., job satisfaction
- Judgment-driven behaviors  
e.g., job withdrawal/commitment, prosocial/counterproductive behaviors, leadership behaviors
- Mental health
- Physical health

One of the hardest areas for us to get a handle on pertains to trying to define the problems faced in terms of the criterion outcomes. We can talk very broadly about job performance, but one of the issues that organizational psychologists have always had to deal with is -- what is commonly called the criterion problem -- pertains to figuring out what constitutes job performance. And there has been a great deal of discussion about this in terms of contextual performance, and technical performance, and aspects of performance that have to do with things, with social competencies, and inter-personal competencies. Obviously, it depends very much on the kind of task that you're talking about and the particular work role that you're talking about. But using Weiss's and Cropanzano's framework, you could argue that basically there's two forms of emotion influences on job behaviors. Affect-driven work behaviors are very much straight as a result of emotional processes and include behaviors like helping and absenteeism. In contrast, judgement-driven work behaviors are behaviors in which affect plays a role but does not solely determine behavior.



## Overview

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- A brief history of the study of work affect
- Contemporary themes
  - Dispositional approaches
  - Affective Events Theory
  - Emotional Labor
- Emotion Regulation: The practical interface
- Implications and abiding questions

The target of most research for the good part of the last half of the century has been work attitudes, and most importantly job satisfaction. These work attitudes are posited to influence judgment driven behaviors - which are really the behaviors that organizations often are most concerned about; that is, behaviors related to job withdrawal, commitment, pro-social or counterproductive actions, and leadership. And finally, of course, there are also outcomes that are related to the individual's mental and physical health.



## A historical perspective

### Early contributions – The fecund 30s

Fisher & Hanna (1931)

- vocational maladjustment due to emotional tendencies (person)

Hawthorne studies (Mayo, 1931)

- social situation X person interaction

Hersey (1932)

- periodicity of affect and emotions (railroad workers)

Hoppock (1935)

- focus on job satisfaction; work environment determinants

Now, if you take an historical perspective, you can say that the '30s were a very fertile period. Recent reviews by Howard Weiss and Art Brief have done the field a great service by detailing some of the early organizational research in this area. Fisher and Hanna's work, for example, looking at vocational maladjustment due to emotional tendencies is quite extensive. I particularly like their description of employees they consider ne'er-do-wells and emotionally immature, with the fundamental focus of their work on trying to identify these individuals and screen them out early on. The idea being, if you actually couldn't get rid of them, at least you could counsel them, using the counseling techniques of the day. During this period, the primary focus of the research was on identifying persons with respect to vocational maladjustment, a very broad level of maladjustment. The Hawthorne studies, reported at about the same time, introduced the notion of social relations and work role demands, as well as the idea that such forces might interact with person characteristics to affect behavior, affect and emotions. Hersey's work with railroad workers, took a different approach and looked at the periodicity of affect and emotions. Taken together, these studies serve as early forerunners for the contemporary Weiss and Cropanzano work that looks very carefully at the temporal dynamics and multiple antecedents of emotional episodes that occur in the workplace



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Hoppock (1935)

- focus on job satisfaction; work environment determinants

But, as Weiss and Brief note, the work that was most influential in shaping the way organizational psychologists thought about affect for almost 50 years was the work by Hoppock and others during the mid 20<sup>th</sup> century that focused on job satisfaction. In this perspective, affect was job satisfaction, and the focus was on determinants of job satisfaction in terms of the work environment and person characteristics, such as race or age or so on, such as in the Hoppock study.



## A historical perspective

### Early contributions – The fecund 30s

Fisher & Hanna (1931)

- vocational maladjustment due to emotional tendencies (person)

Hawthorne studies (Mayo, 1931)

- social situation X person interaction

Hersey (1932)

- periodicity of affect and emotions (railroad workers)

Hoppock (1935)

- focus on job satisfaction; work environment determinants

In 1976, Locke wrote what has long been considered the definitive chapter on job satisfaction in which he said that affect is job satisfaction and used a definition that although still common today, you would probably argue is incomplete, in the sense of our understanding. Locke defined job satisfaction as a “pleasurable or positive emotional state resulting from the appraisal of one’s job or experience”, thus clearly emphasizing the cognitive realm. In the mid-century most of the work on affect was work on the motivational pathways by which characteristics of the job influenced both performance and satisfaction; never mind the fact that performance and satisfaction weren’t related. A happy worker is a productive worker, even though the demonstration of that using satisfaction measures were quite inconsistent. Human relations approaches said, “But that’s all right, because satisfaction is an important outcome in itself.” But the bottom line was that affect was considered and regarded to be simply the appraisal.



## The New Look

Three streams:

- Dispositional approach to job satisfaction  
(Staw & Ross, 1985)
- Person-situation determinants of affective episodes/Momentary mood and emotion at work  
(AET, Weiss & Cropanzano, 1996)
- Work demands/Emotional labor  
(Hochschild, 1983)

Today there's a new look in research on workplace affect and it's informed primarily by many of the things that we've heard in the last couple of days, advances in basic domains. And not surprisingly, there's three approaches that capture much of the new look in work psychology, and these follow some of the advances in each of the domains we've talked about. The first approach has been called the dispositional approach to job satisfaction, the second drawing from the Weiss and Cropanzano model, which really attempts to get at the momentary moods and emotions that are displayed in the workplace, and the third approach pertaining to work that's represented by work by Alicia and deriving from this notion of emotional labor and very much consistent with the increase in the post-industrial environment, the increase in service sector jobs, and increased work demands on emotional expression.



## Dispositional research

- Emphasis on dispositional causes of job satisfaction
- Staw & Ross (1985)  
Stability in job attitudes over time and circumstances
- Positive and negativity affectivity  
Affectivity → mood states → job satisfaction

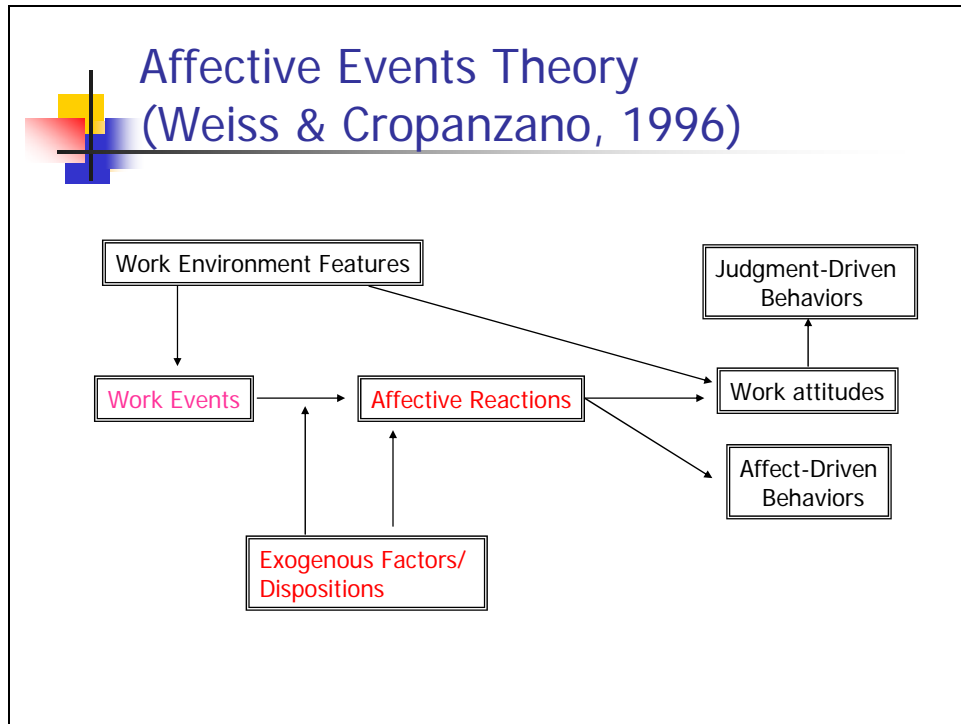
In the dispositional perspective, the first most important study was that conducted by Staw and Ross, in which they looked at the stability of job attitudes over long periods of time and changed circumstances. What really made that study so important was what those data suggested; namely that, you know what? It's time to stop looking only at the situation. Some people are just unhappy. Some people are just happy. It doesn't matter what job they have. It doesn't matter if their job is enriched or it's not enriched, if they like their supervisor or they don't. It really doesn't matter. And, although the data were somewhat controversial in terms of interpretation, using a longitudinal data set enabled them to show considerable stability as a result of basic dispositional tendencies, in particular negative and positive affectivity.



## Affective Events Theory

- Focus on structure, causes, and consequences of affective experiences at work
- Emphasis on events and their consequences
- Temporal dynamics of affective events


In contrast, Affective Events Theory (AET), proposed by Weiss and Cropanzano in 1996, took a very different approach to the question of affect and work. AET focused on the structure, causes and consequences of affective work experiences --much more in line with the kind of thing I think we've been talking about at this conference, and also in terms of my concern for emotion regulation. AET emphasizes the events themselves and their consequences, and the temporal dynamics of those affective events.



This is the essence of the AET model. Basically you have work events, which yield affective reactions, which in turn yield these different organizationally-relevant outcomes. It's an interaction model, there's no doubt about it. And what Weiss and Cropanzano and their colleagues are doing is using diary studies to try to get at a description of these events.



So what are some of the salient work environment features that influence the instantiation of events and development of work attitudes? Well, using a relatively crude organizational scheme, we can talk about multiple influences operating at multiple levels, including socio-affective factors related to broad organization characteristics, features of the social relations in the immediate workgroup, and features of the collective.



## Work Environment Features

(continued)

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Structural:

- Physical setting
  - temperature, noise, lighting, tempo
- Task and materials
  - machines, resources
- Organizational rewards/punishment
  - pay, prerequisites

Then there are also structural factors, task materials, and the reward structure that may also affect affective reactions and outcomes.



## Emotional Labor

- Work role requirements for modulation of emotion
  - Job-based emotional display rules
  - Adaptable emotion regulation
- Labor as  $f(\text{person} \times \text{work role demands})$
- Psychological and physical consequences

Now the third theme relates to the notion of emotional labor, but since we already heard a very eloquent presentation from this perspective I won't go over it much. Basically this research theme starts with the work role requirements for the modulation of emotion, which is job-based emotional display rules. That is, jobs demand emotion regulation, or emotional labor. And, the idea that individuals engage in adaptable emotion regulation, or labor, is seen as a function of the person and work role demands. This work-related labor, in turn has important psychological and physical consequences. Glomb and Tews recently wrote a paper where they suggested that we might usefully define emotional labor in terms of a two-dimensional framework that emphasizes the individual's felt emotion and the demands of the work role in terms of emotion display.



## Emotional Labor

- Work role requirements for modulation of emotion
  - Job-based emotional display rules
  - Adaptable emotion regulation
- Labor as  $f(\text{person} \times \text{work role demands})$
- Psychological and physical consequences

According to Glomb and Tews, problems arise and there are costs involved when you feel an emotion that you can't express or you must express an emotion that you don't feel. If you're fortunate enough to have a job where you may express your felt emotions often the case in professional or higher status positions, you are less likely to need to engage in emotion regulation or to be identified as a maladjusted worker. Now as I will argue more fully in just a minute, the adjusted worker may indeed be the individual who has in fact chosen wisely his position to correspond to his emotional expression tendencies.



## Recent evidence

- Similarity across occupations for display rules that demand suppression of negative emotions
- Expression of negative emotions (genuine or faked) related to emotional exhaustion

Two findings in this area are particularly interesting. First, is evidence to show similarity across occupations for display rules that demand the suppression of negative emotions. It should come as no surprise, but the suppression of negative emotions, is a near universal rule in modern work settings. Second, there is initial evidence to indicate that, even when negative emotion displays are permitted, the expression of negative emotions, whether they are genuine or faked, are positively related to emotional exhaustion.



## Summary

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Renewed scientific interest

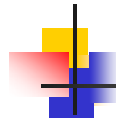
Distinguishing affect, emotions, and job satisfaction

Personality influences on job satisfaction

Emotions as affective events in the workplace

Emotion regulation as work role demands

So in summary, theory and research in the organizational domain has been quite active during the past decade. There has been renewed scientific interest in distinguishing affect and emotions from attitudinal variables, such as job satisfaction, for the study of person influences on job satisfaction, for the study of emotions as affective events in the workplace, and for the study of emotion regulation as one aspect of work role demands.



## Linking theory to practice: Emotion Regulation

Emotion regulation:

The processes by which individuals and environments influence the experience, expression, and control of an individual's emotions (self and other)

Proximal determinant of work behavior and performance

Now if I can change the focus for just a minute, for the remainder of the talk I would like to link some of these developments and general theories to organizational needs and practices that influence emotion regulation. A number of researchers have defined emotion regulation as a special form of self-regulation as described by social-cognitive and cybernetic theorists, such as Carver and Scheier, F. Kanfer, and Bandura. Other researchers have broadened the definition to include aspects that go beyond the typical self-regulation perspective, for example by including the processes by which individuals and environments influence the experience, expression, and control of another's emotion. It's self-regulation when the focus is directed toward the modification of the self variables. It's situational regulation or situational outcome regulation when it's directed towards changing another person's emotions and/or the environment. One of the most important differences between models of self-regulation being scaled up to this issue and considerations of EI, is that one of the most effective strategies taken from the aging and developmental research is to change your situation and reduce the high cost associated with self-change. That might be considered problem solving, but it is the first line of defense in emotion regulation. If you can just change the demands, change the stimuli that trigger or generate the emotion, it's a really powerful way to do it with relatively little cost. I argue that it's the proximal determinant of work behavior and performance and it's absolutely essential for us to know more about these regulatory processes, the person characteristics that influence them, how they influence them, the temporal dynamics, how they play out, and how they're combined. There certainly is a lot to do in this area.



## Basic tenets

- Focus of regulation is the contextualized self or others  
(i.e., modulation of emotional processes in context of physiological, cognitive, motivational, and environmental presses)
- Emotion regulation targets the generative process and/or emotion-related behaviors

The approach I am taking to emotion regulation in the workplace has two basic tenets. First, the focus is on the contextualized self or others. Regulation of emotions and emotion-related behaviors that affect performance cannot be considered outside of the physiological cognitive motivational or emotional presses. Such regulation is also not likely to be very generalizeable. Attempts to train regulatory strategies outside the workplace, divorced from the workplace, tend not to work very well for specific emotions. That's not to say that training to increase elements of the regulatory process like monitoring may work well, but rather that the overall effectiveness of regulatory strategies really has to be contextualized. Emotion regulation can target the generative process or it can target emotion related behaviors. And those emotion related behaviors that are important to work are the behaviors that affect motivation and that affect cognitive attentional costs.

## Emotion regulation in service of goals




### Multiple purposes

Reduce subjective distress

Reduce unacceptable emotion-related behaviors

Promote accomplishment of nonemotional goals

Emotion regulation does not occur in a vacuum but rather in terms of the individual's goals. Commonly, the individual's primary goal is to reduce subjective distress, even if the regulatory strategy ends up being very costly and distressing in itself. Another personal goal for engaging in regulation could be to reduce unacceptable emotional related behaviors, and it can be to promote, and this is a very important goal, the accomplishment of non-emotional goals, such as by replacing a disruptive or a dysfunctional emotion with a more functional emotion in order to attain another instrumental goal.



## Emotion Regulation as Set of Self Processes

- Monitoring
  - person influences on monitoring
- Evaluation (appraisal)
  - goal influences
- Action (regulation)
  - skill competencies

Consistent with other self-regulation approaches, emotion regulation involves a set of processes that includes monitoring of one's emotions. Ekman talked about this first emotional skill in terms of an awareness of one's emotions, an awareness of being able to detect an emotion. It's always been the case in self-regulation that monitoring is critical. It also importantly depends on what you're monitoring. You could be monitoring the wrong thing. It also depends on how good you are at monitoring – how sensitive and accurate you are. Self-monitoring is really important, because it's the start of the entire regulatory process. Without monitoring to detect a problem there is no change, because you don't necessarily conduct an evaluation. Now some situationals are so emotionally overwhelming that you might not need to monitor them, the emotion just hits you. As Ekman pointed out, you can be hit. in that an appraisal may occur without monitoring. The third part, which is what I talk about as emotion regulation and regulation strategies, are the skill competencies or the skills, Ekman talked about this aspect of regulation in terms of choosing the way you're going to go about addressing the discrepancy. We talk about it as a skill, we assume it can become proceduralized, it can become practiced. Although there's relatively little evidence in the work domain, the notion here is that as a skill, in the contextualized environment, we can develop these competencies and even some self-regulatory strategies that may become less costly over time.



## Toward a taxonomy of operations

Regulation via strategies:

Covert or overt acts involving physiological, cognitive, and behavioral systems

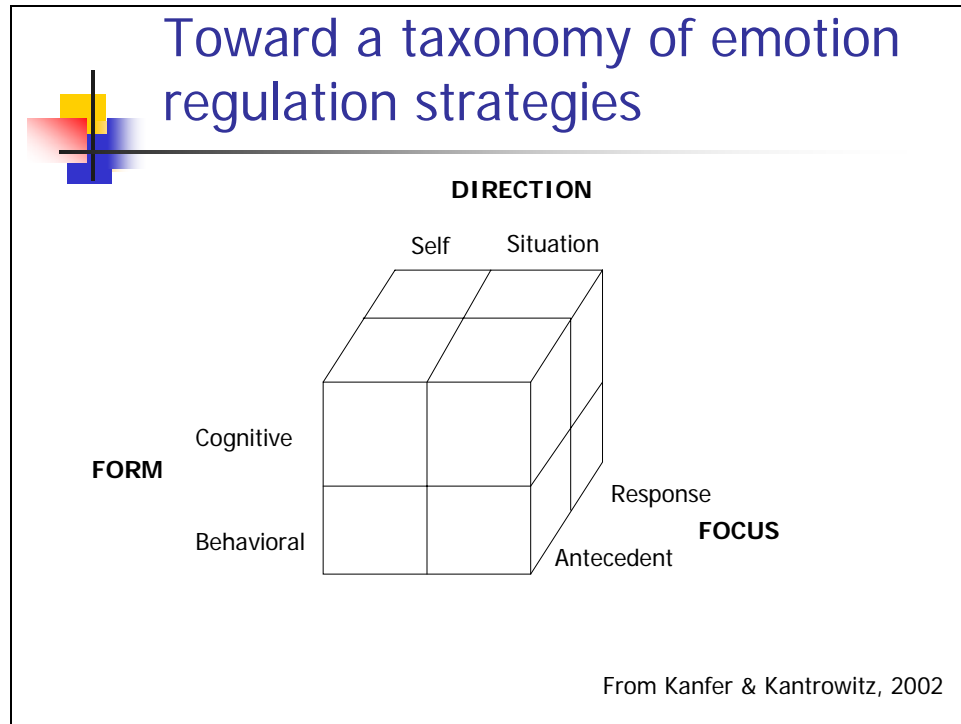
Strategy may be implemented for specific event or for regulation over time

Dimensionality (Larsen, 2000)

Mode: Cognitive vs Behavioral

Directedness: Self vs Situation

Towards a taxonomy of our operations; basically, I am suggesting an organization of the various strategies in presumably synchronized physiological, cognitive and behavioral systems, although synchronization is still an interesting question. Different strategies may be implemented for a specific event or for regulation over time. But the strategies tend to be context specific. The classic distinctions among strategies suggested by Lazarus and Gross, among others, have been between emotion-focused and task-focused strategies, cognitive and behavioral strategies, and between antecedent and response focused strategies. Included here is also an interesting distinction that Larsen added - on the direction of the strategy being toward the self versus the environment.



And support for that notion really comes from, interestingly enough, the aging and developmental literature. Jutta Heckhausen and Schultz, for example, argue for a theory of motivation by which individuals seek first to exert primary control. Self-regulatory strategies are the second line of defense and can be distinguished in terms of their direction toward self or towards a change in the external environment. And when you do that -- you change the external environment -- you gain a short-term advantage, because the cognitive costs go down. That is, you may leave the job and reduce distress, but you may have a long-term disadvantage because you have to keep sustaining that environment. And some things just don't work out that way. For example, you can't avoid a cadaver in medical school. You can be absent once, you can be absent twice, but you can't be absent forever. Some things are just not highly amenable to situational solutions. So that represents this initial start towards a taxonomy of these regulatory strategies, which takes into account previous work and seeks to extend that work to the job domain.



## Implications

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- Primacy of situation-oriented strategies
- Preference for antecedent-focused strategies
- Self-oriented, response-focused strategies most difficult to implement

There are three major implications of these theoretical approaches the tentative taxonomy. First, there is presumed to be primacy of situation-oriented strategies. When you look at evidence across the life course you do find support for the notion of a preference for situation-oriented strategies or selection of situations, especially among younger workers. As you get older and you can't select, you start working on the self. You do what you can. The second implication is that there is a preference for antecedent-focused strategies, relative to response-focused strategies. That is, it is better to not generate the emotion than to pay the cognitive costs associated with controlling the emotion. Now that's related to individual differences in whatever you care to call it, personality affective dimensions. And, of course the extent that those individual differences influence the frequency of the generation, that will influence emotion regulation load. So it's not unrelated. Individual differences play a role in two places, meaning that they really spiral, and they multiply, and their effects tend to be multiplied over time.



## Implications

- Primacy of situation-oriented strategies
- Preference for antecedent-focused strategies
- Self-oriented, response-focused strategies most difficult to implement


Now the third implication is that self-oriented response focus strategies, which are often talked about on radio programs, are really the most expensive and difficult to implement. In the context of achievement, we have found that such strategies exert a high cognitive attentional cost and hamper skill acquisition. Gross and his colleagues have looked at suppression strategies, which is really this response based self-oriented strategies to reducing anxiety in the context of the skill training. When we studied response-based strategies in terms of acquisition of air traffic controller simulation performance, we found that the cognitive cost and the decline in performance is more pronounced for lower ability individuals than higher ability individuals. But when we had persons implement the strategy in a massed – spaced practice paradigm, the cost to performance are dampened for everybody, and that when we trained individuals in emotion control outside of the training context and then put them in a training-transfer paradigm, the lower ability individuals actually were better served than the higher ability persons, suggesting that there are some very serious cognitive costs to emotion control in the context of achievement. If you scale up a bit to looking at a more macro-level, you see the same pattern. For example we've looked at emotion and motivation control skills in job search following involuntary job loss. What we find is that both emotion control and motivation skills (the ability to initiate action as well as the ability to keep negative, disruptive emotions at a minimum) are related to initial job search intensity. But only motivation skills relate to later job search intensity. So there's a complex relation between emotion and motivation regulation strategies that has yet to be teased apart.



## Determinants of ER

- Person factors mediate multiple aspects of the emotion process in way that exacerbates positive or negative trends in adaptive functioning


As I said previously, individual differences in personality, interests, and regulatory competencies mediate multiple aspects of the emotion process in a way that is expected to exacerbate positive or negative trends in adaptive functioning.



## Person influences on ER

- Interindividual differences
  - NA/PA, Neuroticism
- Intraindividual differences
  - Age-related increases in emotion regulation
  - Strategy differentiation:
    - Antecedent-focused, situation-oriented strategies for regulation of emotions related to self
    - Response-focused, self-oriented strategies in contexts that trigger other-directed emotions (anger)

This raises another issue in terms of person factors. There are two kinds of individual differences that we really need to consider in the workplace, that you don't necessarily need to consider in school. One is the interindividual differences, the classic one. But the other are these intraindividual differences that occur across the life course. The evidence, and Derek I believe will talk about this more, is that there are age-related increases in what's considered emotion regulation or emotion control. But there also appears to be some sort of strategy differentiation. It turns out that situation-oriented strategies for self-oriented regulation are preferred among younger workers. Among older workers, however, there is a tendency to use antecedent or response focused self-oriented strategies for dealing with social or other directed emotions. So we must consider that strategies may change with age-related changes in the person. It's not just that you get better over the life span at a particular strategy, but that you change your strategies. And that's very important, because of increasing limitations over the life course – at least in the workplace. You can't necessarily change jobs as easily at 55 as at 25, and the extent to which people do that is probably a very important consideration. So not only are individual differences characteristics and work role demands important determinants of emotion regulation strategy development and use, but so is the broader socio-political context and organizational attempts to influence emotion regulation strategies.



## Organizational influences

(Ashforth & Humphrey, 1995)

- Neutralization  
antecedent-focused, cognitive
- Buffering  
antecedent-focused, cognitive
- Prescribing  
response-focused, behavioral
- Normalizing  
antecedent-focused, cognitive

With respect to organizational influences, Blake Ashforth and his colleague, Humphrey, have identified four basic strategies by which organizations tend, during socialization in service sector jobs, to influence employee emotion regulation. Most of these strategies are antecedent-focused cognitive, and self-oriented. As such, they place a heavy burden on the new employee.



## Abiding questions

### I. Organizational entrainment of emotion regulation strategies?

#### Example:

Influence of long tenure in military on emotion regulation in extraorganizational work life (job search, new job training)

#### Research implication:

Work role histories as proxy measures of emotion regulation competencies

In summary, I think there are three large and important questions for advancing our understanding of emotion regulation in the context of work. The first is this question about organizational entrainment of emotional regulation strategies. I've always wondered about the extent to which people talk about particular personalities associated with occupations. In fact, the question is, do occupations entrain regulatory strategies? For example, we talked about air traffic controllers who are often described as having a "cowboy" mentality, that emphasizes frequent emotional episodes and rapid control sequences. Perhaps a better example might be how a long tenure in the military might in fact entrain particular regulatory strategies, that in turn have an effect on extra-organizational work life, such as job search, new job training or home strategies, and may or may not be adaptive. One implication of this way of thinking is to take a closer look at the individual's work role history to develop a proxy measure of emotion regulation competencies. And you can compare organizations and occupations in terms of the emotion regulation demands. Unlike school, employees stay in organizations differing amounts of time. Most of our organizational studies that have looked at emotion regulation are cross-sectional -- they are not within individuals -- and so don't study individuals in a way that allows us to study entrainment. We need to do those kinds of longitudinal studies in order to look at that.



## Emotion regulation for what?

### Carrying on, getting along, or getting ahead?

#### Carrying on:

Minimize emotion-related cognitions and behaviors that reduce persistence (anxiety, fear)

#### Getting along:

Suppress negative emotion-related behaviors directed toward others (anger, rage)

Express positive emotion-related behaviors toward others (helping, cooperation)

#### Getting ahead (as leadership):

Minimize emotion-related cognitions and behaviors directed that reduce persistence (anxiety, fear)

Express positive, emotion-related behaviors directed toward others (sympathy, attachment)

Express positive-related cognitions and behaviors toward self (pride)

The second question pertains to the purpose of emotion regulation – that is, emotion regulation for what? At any given time, there are multiple demands and motives for action. And, it seems to me that one of the problems always has been related to what Bob Hogan has talked about, namely that there are different purposes for engaging in emotion regulation. For one, you have this notion of carrying on, to persist on your technical task - something you might call in the organizational world carrying on. Then there is getting along – emotion regulation to facilitate cooperative and effective team relations. And getting ahead or what I think of as emotion regulation in the leadership role for the purpose of facilitating positive emotional states in others. As you can see, at any given point of time, an event may occur with respect to one or more of these goals. Carrying on to complete a task, for example, involves regulating the frustration, anxieties, and fears that may divert or dampen attention and effort directed toward learning or performance accomplishment. You want to minimize the disruptive costs because of the online and our resource allocation model would suggest that the self-regulatory activities until they're proceduralized divert critical cognitive resources. Getting along, however, is a different story. Now you're doing both suppression and expression. It's a more costly strategy, but you don't have the time constraints. In terms of leadership, you have even more demands for emotion regulation. But again, there is more flexibility in terms of how to manage the demands.

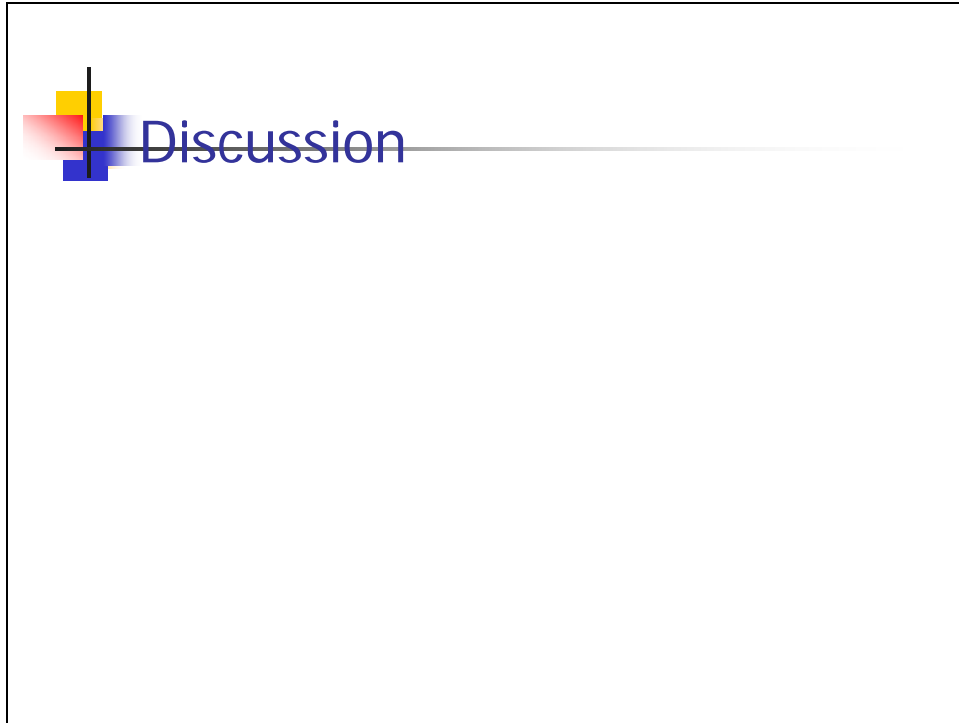
## Abiding Questions

(continued)

III. Are we looking at the most useful person constructs?

Attachment as an integrative trait complex (relational construct) that affects both appraisal and emotion regulation

And finally, I have this concern, which may not be a very popular one, about whether we're looking at the most useful person constructs. In organizations, emotions such as envy, shame, guilt arise more frequently than we might like to think. These are specific emotions for which we really don't know much about which regulatory strategies are used. And perhaps what we really want to look at are person variables that are more integrative, Lazarus calls these relational concepts, but take into account affect motivational nodes if you will. And how those different styles and complexes may affect both the generative emotion process and the choice of regulatory strategies is an important question. Rather than looking at it as a combination, I suggest that we might also look at it in relational terms. And the reason that I argue for these kinds of things is because there are very serious problems with respect to emotion in the workplace that aren't easily explained by dimensional models. So when people talk about, for example, differences in when you get laid off, whether or not represents a family for the employee, and so on, the intensity and the nature of that emotional reactions that ensue may very much be a function of the kind of attachment style that you approach the work with. And we need those kinds of relational concepts in order to understand some of these more, I think, severe emotional reactions to increasingly frequent organizational events. That's it. Thank you very much.

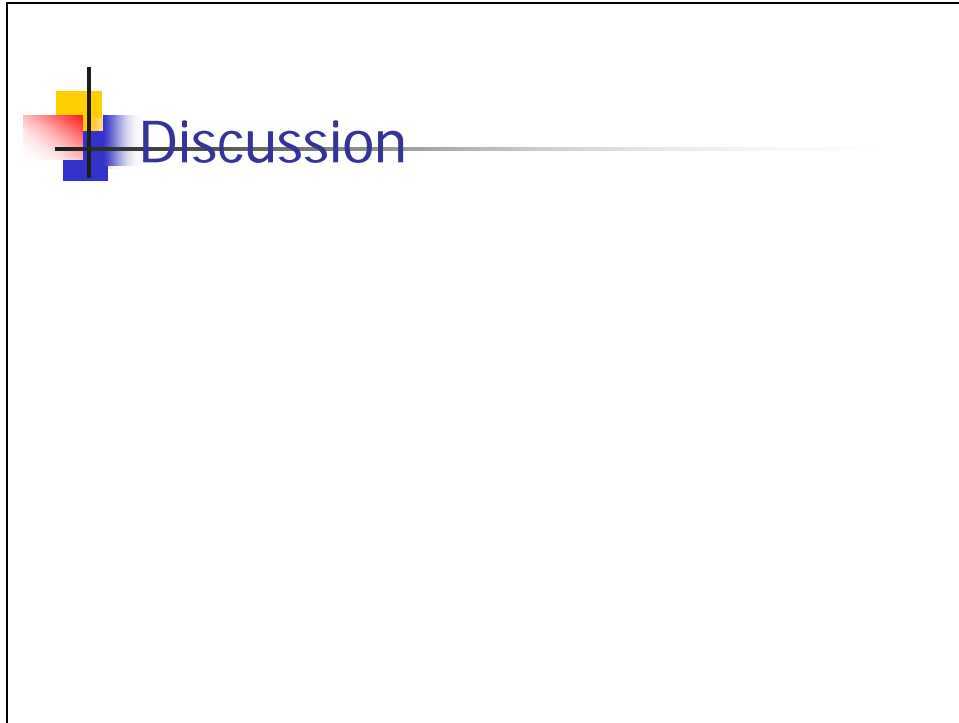


## DISCUSSION

**DR. LEN WHITE:** This isn't maybe not really a question, but as you were talking, it strikes me that I work with the U. S. Army. There are really a lot of issues pertaining to what are the soldiers' emotional reactions to joining the army and staying in the army. And I'm particularly concerned with the emotional response to maintaining your commitment to a soldier, because as a soldier their concern may be there's a lot of disappointment, there could be anger, perhaps even disgust or contempt at times. And on the positive side, perhaps there's also the feeling that maybe soldiers aren't having as much fun anymore. So the way of coping with that is exactly what you said, what I'm going to do about this is change my situation. And there are two ways of doing that. One would be to not reenlist when the question comes up, or with junior enlisted perhaps, I'm going to devote my resources to figuring out how I can get out of here legally.

**DR. KANFER:** Well there is a cue in the situational strategy. If you look at the cue there is in situation, you may alter the outcome by altering cognitive and behavioral actions ...

**DR. LEN WHITE:** And I guess my question would be what approaches might the services take to change these negative emotions into more positive emotions, or to direct soldiers to perhaps choosing a different strategy than changing the situation?

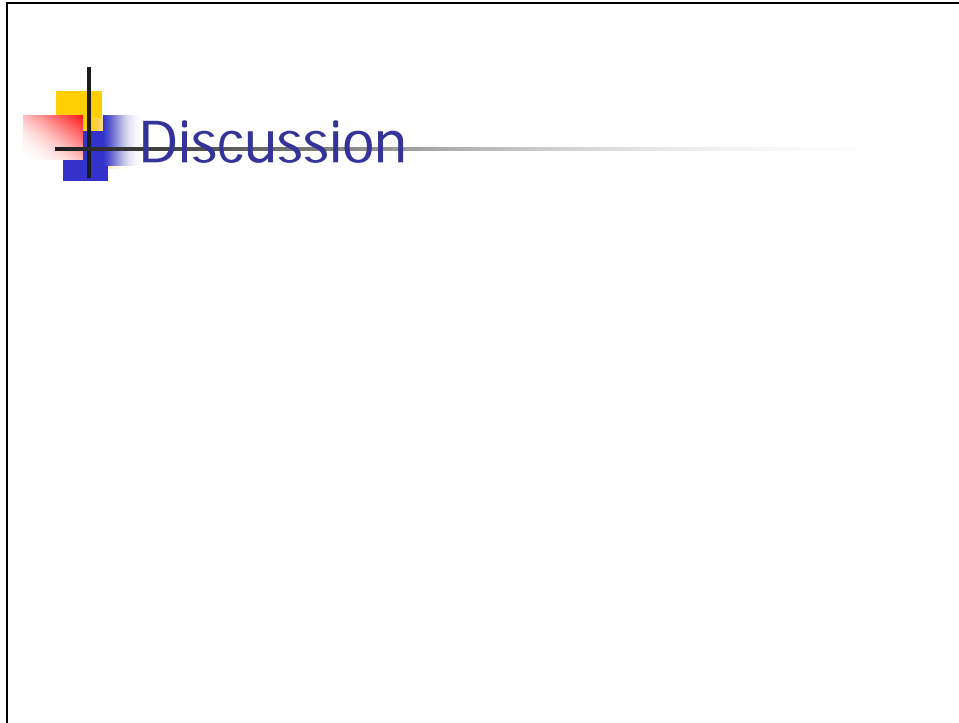


**DR. KANFER:** Well if you want them to do self-regulatory activities, to do that, I mean you're going to have to reduce their cognitive cost, because it doesn't make sense to them. I think it's not a terribly imaginative way. You provide an incentive for engaging in self-regulatory cognitive behavioral acts that actually, you know, in classic cognitive behavioral programs that actually increase the attractiveness of staying. I mean you can do that structurally, through relationships. You can do that structurally through incentives. You can do that inspirationally through leadership. But you have to reduce the cognitive cost. You can't lay it on the soldier to do that, because they have no inherent incentive to do that.

**DR. GADE:** I'm curious. You mentioned that older workers develop a different strategy from younger workers.

**DR. KANFER:** It appears so.

**DR. GADE:** Yet the data are not longitudinal, number one. And number two, couldn't it possibly be that you're really drawing from; it's really a long process where you're turning what is you're calling situational control into a more automatic kind of control?

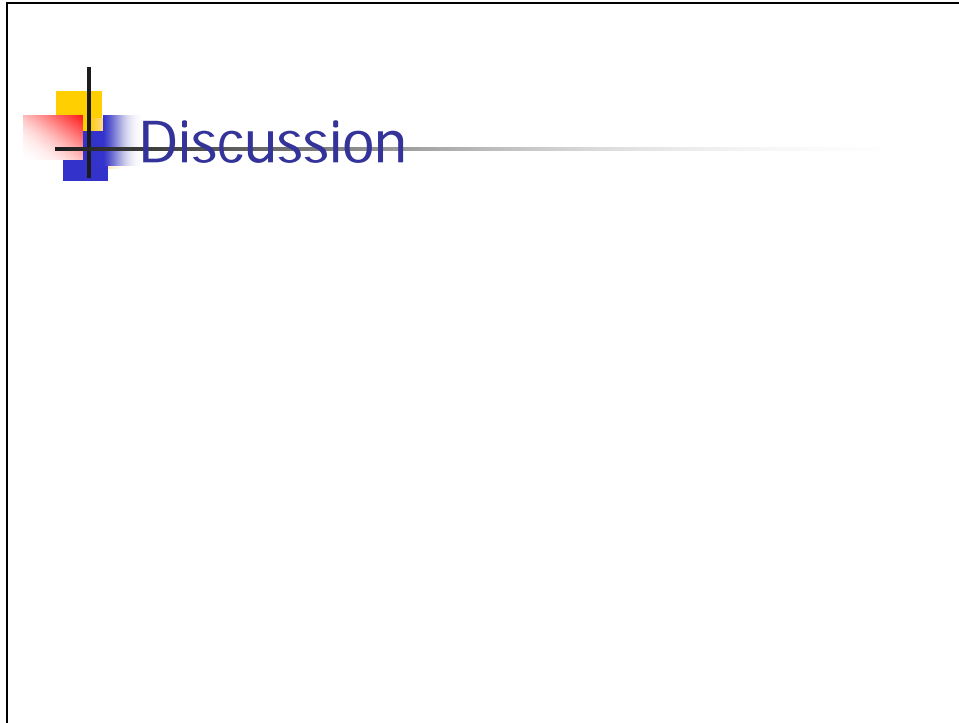


**DR. KANFER:** That is always possible, yes, because it could become a feature, that's the entrainment issue. You actually could entrain effective regulatory strategies that really make self-regulation less difficult when you're older, depending on the environment. And I should say that those data in the aging literature are not specifically on emotion regulation in the context of work. In fact, they're really focused on general life measures, but there really isn't much in work. I don't know, Derek may know of some work but I don't think there's anything in the workplace. This is, however, a very important issue.

The transformation, the proceduralization – who proceduralizes, how well they proceduralize? Is it a function of, for example, staying in the organization? Or is it a function of other things? Don't know. One of the things you could argue is you stay with us, you develop really great skills. You could potentially.

**DR. LEN WHITE:** Well that's the message they're trying to get out. And then part of this is by training up partnerships with industry, so you develop a solidier but there are also partnerships such that you have a civilian place that you're preparing for as well once you leave.

**DR. KANFER:** Well you could call it the SEL programs, stage 2. You know really in some ways you're doing what didn't get done K-12.



**DR. SAUCIER:** This is less a question and more of a request to kind of hear you think about it or perhaps others. As you were talking about regulation of emotion in organizations, one of the thoughts that occurred to me is that there are emotional aspects to climate and culture within organizations and that emotionally intelligent individuals may be able to help regulate that climate within the organization to meet their own needs, whatever those might be.

**DR. KANFER:** Their own needs, or the needs of the organization or both?

**DR. SAUCIER:** Depends on other things.

**DR. KANFER:** Well I talk about them as Machiavellian. It's their own needs, you know, and you want to talk about them as for the good, it's the organizations, it may be, or for example with Enron, maybe not. I mean some part of what the good is, you can't make a final judgment on that. But yes, people have begun to talk about in the leadership domain, actually how the particular regulatory strategies that leaders use to regulate emotion-related behaviors that motivate followers, and there are certain things that you can do. There are strategies that you can use to motivate followers. That would be how you would do it, change the climate. We're actually beginning a study of that. I'm very interested in that.



## PLAYING WELL WITH OTHERS: EMOTIONAL INTELLIGENCE MEETS TEAM PERFORMANCE

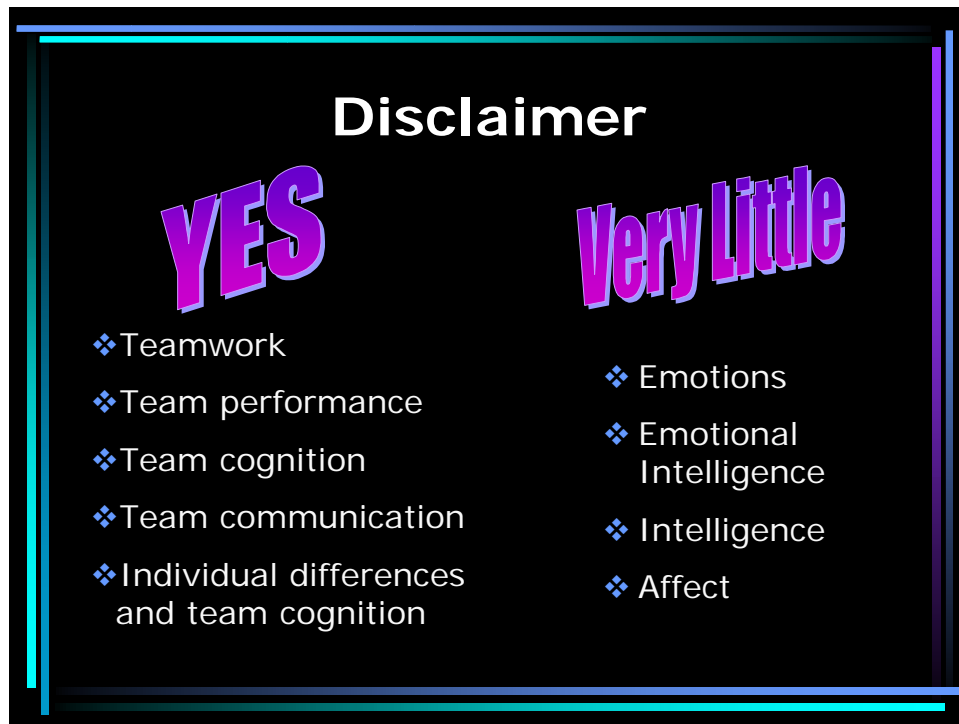
**DR. MATTHEWS:** Our next speaker is Nancy Cooke, and she's going to speak on "Playing Well with Others: Emotional Intelligence meets Team Performance".

**DR. COOKE:** I want to thank the organizers for inviting me here and I want to thank the rest of you for staying here, because we're down to the bitter end. This is about playing well with others and that's just my sort of rendition of what it means to have high levels of emotional intelligence in terms of teamwork.

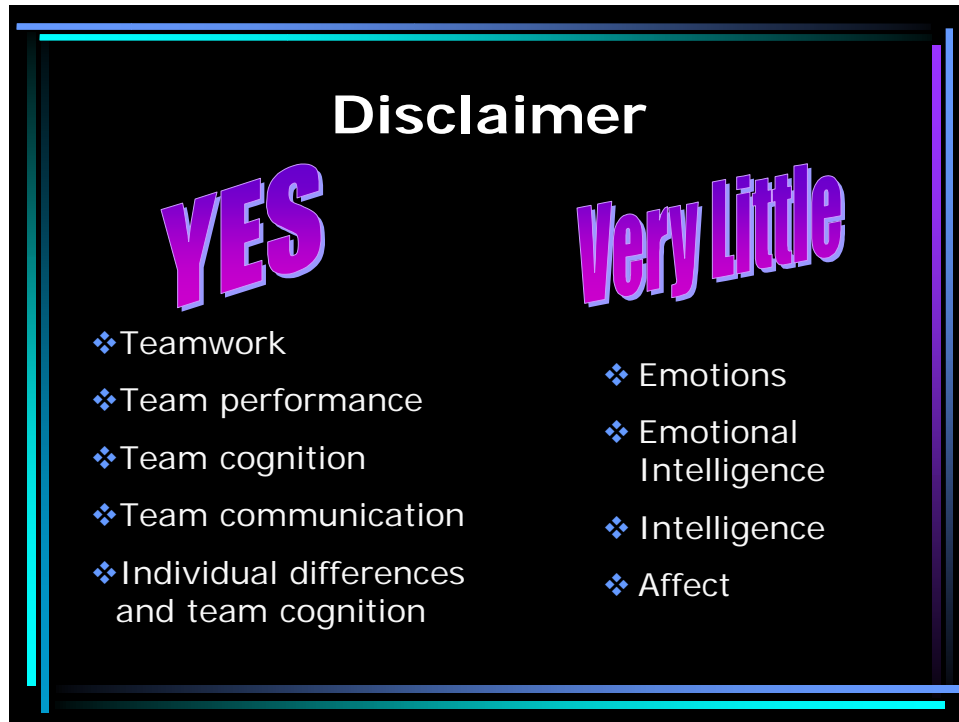
## **Collaborators**

- ❖ **NMSU Faculty:** Peter Foltz
- ❖ **Graduate Students:** Janie DeJoode, Jamie Gorman, Preston Kiekel, Rebecca Keith, Melanie Martin, Harry Pedersen, Olena Connor, Pat Fitzgerald
- ❖ **US Positioning, LLC:** Steven Shope
- ❖ **UCF:** Eduardo Salas, Clint Bowers, Jan Cannon-Bowers
- ❖ **Institute Partners:** US Positioning, AFRL in Mesa, ASU East, Williams Gateway Airport
- ❖ **Sponsors:** Air Force Office of Scientific Research, Office of Naval Research, NASA Ames Research Center

And let me start off by saying the work I'm going to be talking about today was done as part of a larger team, that includes all of these people, and I want to make a disclaimer.



I hope you won't all run out of the room after I make this. First of all, my focus in my research is on team performance and team process, but especially on team cognition. And for the last ten years or so, I've been trying to understand what that means, team cognition. There's a lot of constructs that have been used lately such as team situation awareness or shared mental models, and I've been trying to understand that, primarily in terms of how we measure that in the context of teams, and I'll tell you exactly what that context is in a minute. I have also looked at team communication, have helped develop some methods for trying to automate the analysis of team communication, which if you've ever worked with team communication you might appreciate. And I've done some work looking at individual differences in team cognition. However, although I recognize that emotion and emotional intelligence is central to team performance, I have not directly done any work on that myself. I have some hint of the importance of it in my data, and I know about some data, but primarily I think that there are some lessons to be learned here from my struggles with the construct of team cognition and how we might try to extend, not the struggles, but maybe some of the solutions, to the idea of uniting team emotion with team performance. What does it mean to play well with others?



So what I'm going to do today is to tell you about an assumption that I have about playing well with others, and I want to try to narrow the playing field a little bit, teamwork is a pretty broad application area and I want to sort of paint a picture for you of the domains in which I've been working and the kinds of tasks in which we've been doing our research, so you can see where I'm coming from, and talk a little bit about the research in team cognition and some lessons that we've learned along the way, and at the same time try to draw some extensions to emotional intelligence. I also want to spend some time talking about our communication analysis and how we do assessment of team cognition using communication. I think that that might be a fruitful area for work on team emotions. One of the lessons learned in looking at team cognition is it might pay to look at team cognition in a more holistic kind of way, and I'm wondering if there is such a thing as team emotion, if you can characterize a team as a unit in terms of its emotion.

YES	Very Little
❖ Teamwork	❖ Emotions
❖ Team performance	❖ Emotional Intelligence
❖ Team cognition	❖ Intelligence
❖ Team communication	❖ Affect
❖ Individual differences and team cognition	

I'm going to start out with some assumptions and these assumptions are primarily based on two days of listening to all of the talks here and learning so much from you. And I think that we can safely assume in the context of this audience that emotional intelligence exists, and that it can be measured, and I'm going to assume for this talk at least that it's associated with the ability to play well with others, that is, it's associated with good teamwork, the ability to work well on a team. And if you can work well on a team, supposedly you will have better team performance, your outcomes will be better. And that assumption is supported not only by folk theory, the idea of playing well with others, but by casual observation and more formal observation of teams, and also by some results that have been presented here, such as the work of Mayer and the MSCEIT scores being correlated with people who are more team oriented. And I also learned just recently of some work by Zeng and Wayne Shebilske at Wright State University, who used a self-report scale that I haven't heard mentioned here, the SEIS Emotional Intelligence Scale, which is a self-report scale. They found in the context of a AWACS team experiment that emotional intelligence was related to helping behaviors.

## Some Questions Regarding Emotional Intelligence and Teams

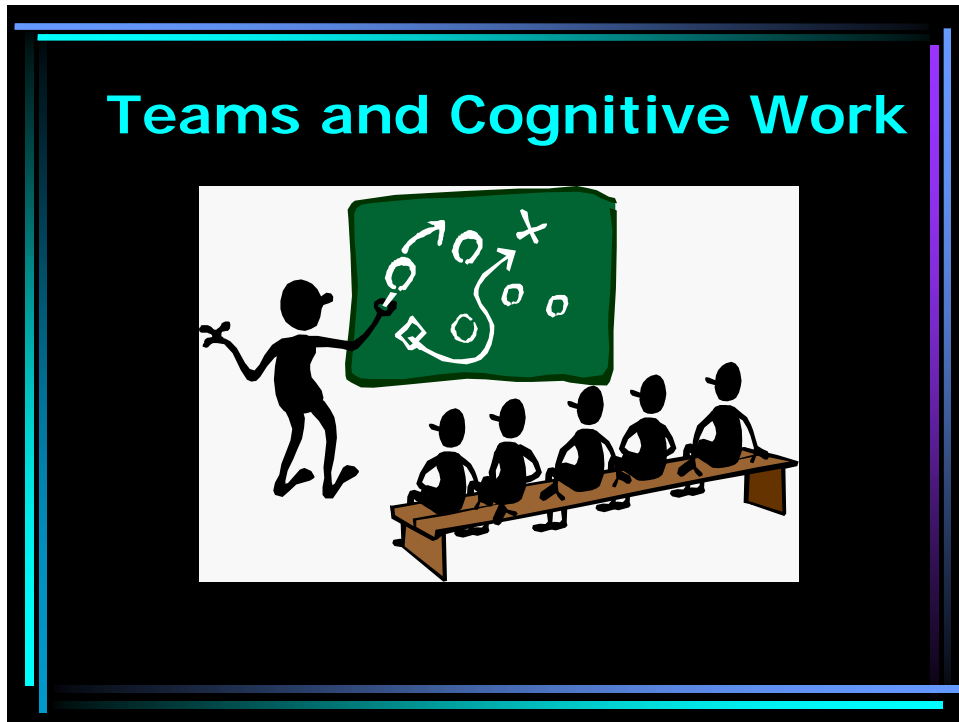
- ❖ How does the EI of a team member affect team performance?
- ❖ How does team structure, role, and team process behavior interact with EI to influence team performance?
- ❖ Is their team EI and is it different from the aggregate EI of the team members?

One series of questions that I'm going to raise, and here in this talk I think I'm going to be talking more about unknowns than knowns, because you just saw what I know about emotional intelligence and team performance. But I think there's a lot of things that I think we need to know that we don't know. Why is there a relationship, if we're going to assume that there is one, between emotional intelligence and team performance? So it improves teamwork, but what does that mean? Does it improve leadership? Does it mean that there's better coordination? And in coordination I mean do people who are high in emotional intelligence better recognize or anticipate what's needed of their teammates? Do they have a better understanding of their current state and of their needs at that time? Is there maybe better conflict management? Is there facilitation of thought and judgment that results from this emotional intelligence? And finally, is there enhanced communication? And this is probably only a partial list of explanations and it could be all of the above, but I think we need to better understand this.

## Overview

- ❖ Teams and Cognitive Work
- ❖ What is Team Cognition?
- ❖ Why Team Cognition?
- ❖ Challenges to Assessing Team Cognition and Some New Approaches
- ❖ Some More Thoughts on Emotional Intelligence and Teams

OK, to the talk. This is the overview.



I want to start by painting this picture for you of the domains in which we've been working and the kinds of team tasks that we're interested in. First, let me give you this definition.

## A Team is...

"...a distinguishable set of two or more people who interact dynamically, **interdependently**, and adaptively toward a common and valued goal/object/mission, who have **each been assigned specific roles or functions** to perform, and who have a limited life span of membership"

Salas, Dickinson, Converse,  
and Tannenbaum (1992)

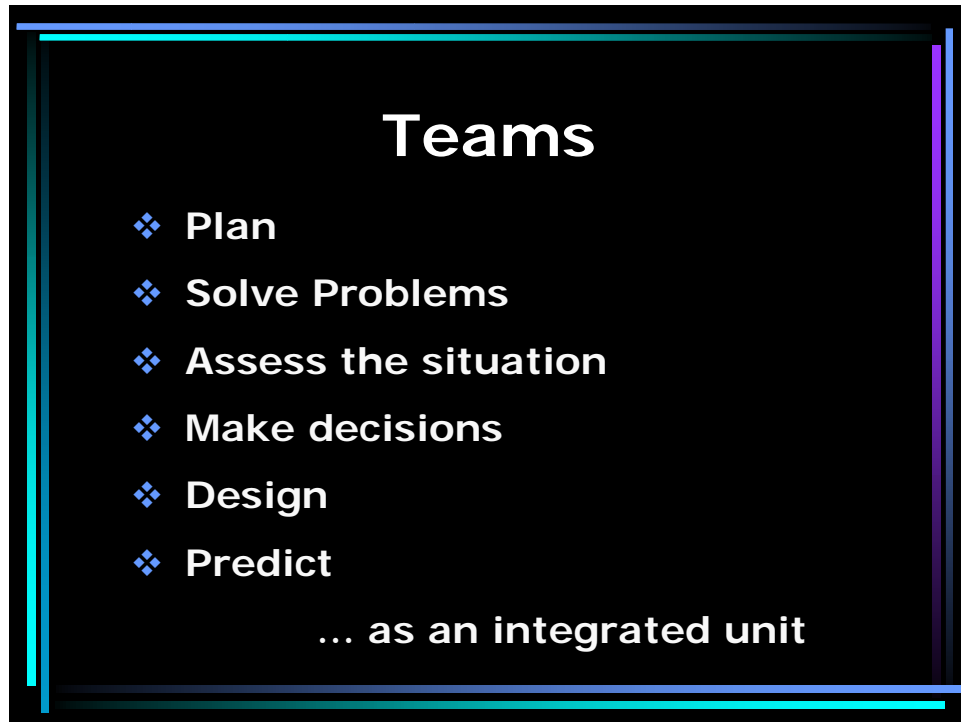
It's not my definition. It's Salas and colleagues, back in 1992 who defined a team as a specific type of group. In order really to distinguish the kinds of teams that they're interested in, from small groups, such as juries, there's been a lot of work on small group decision making and some of the results from that work transfers to these domains, but some of it doesn't. By this definition, a team is "a distinguishable set of two or more people who interact dynamically, interdependently – that's very important for this – and adaptively toward a common and valued goal, object, mission, and have each been assigned to specific roles or functions." The part in yellow there, the specific roles or functions is one of the main ways that I see teams as being differentiated from the larger category of group. Teams come together and each member has a specific job to perform, unlike a jury if you take out the foreman of the jury.



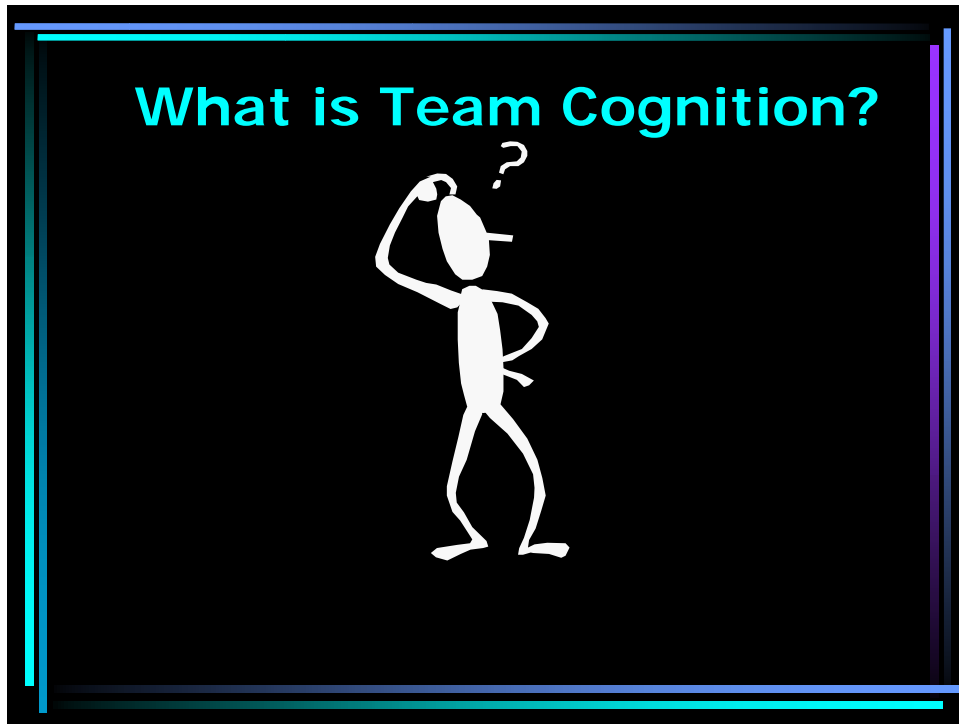
The types of teams that we deal with I would characterize as command and control teams, not only in the military, but also in civilian kinds of applications. We've done observations, for instance, at incident command centers at airports, and I don't want to tell you too much about that because you'll probably have to get on a plane later on today. They're in need of some human factors help. There's also teams who are interested in telemedicine, emergency operations teams in general, NASA mission and control, command and control teams such as air operations teams in the military, and specifically we've been working in the area of unmanned aerial vehicles and the ground control teams that are responsible for overseeing those vehicles. I think it's very important to understand some of the characteristics of these teams and tasks, because I think that they create some unique problems and we can maybe identify some interesting factors that are relevant to emotional intelligence in teams. Their command and control tasks, they tend recently, especially in the military, to be distributed tasks in which people are not face-to-face, they're geographically dispersed, sometimes many, many miles, they don't have the benefit of facial expression. Sometimes they use chat, but they don't have the benefit of audio feedback either. This is consistent with the idea of network centric warfare.



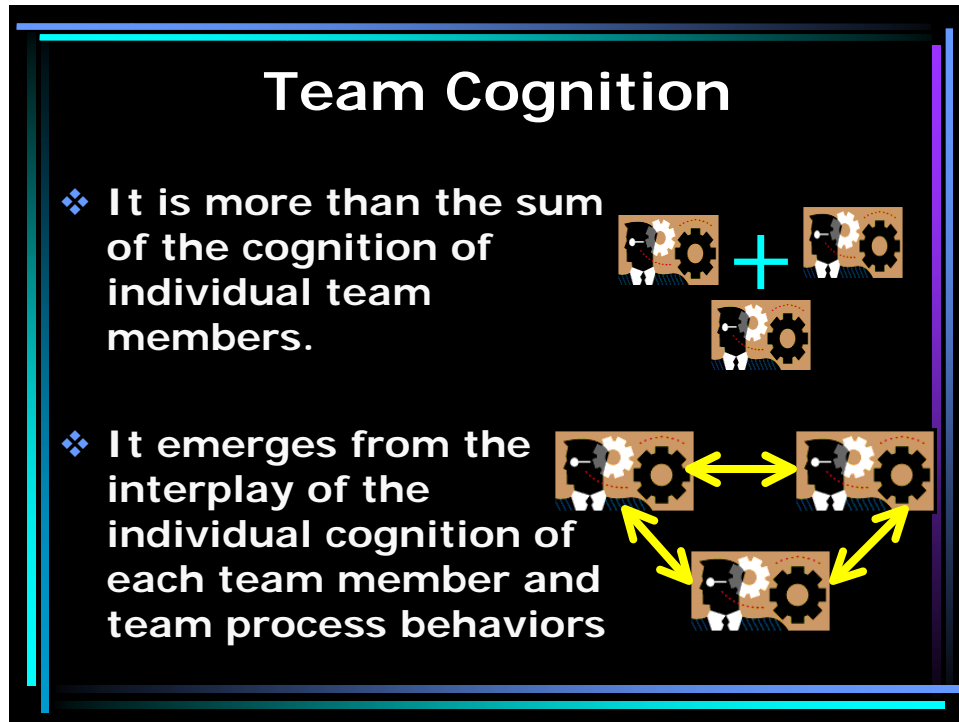
Communication and information sharing, however, are key in these kinds of tasks. That's, as I see it, the primary role of command and control is timely sharing of information. You might characterize them as tasks that are embedded within complex socio-technical systems, so lots of machines, lots of people working together as an entity. They're often hierarchical. It's not really one big team. It's a team of teams and so you have several individuals like ground control stations working with command and control on top of that, and then another later on top of that, and so on. There's lots of cultural issues, often teams are now multinational. Team members are not always familiar with each other. Although they may be trained as a team, they may not come back together and work as a team ever again. Teams may change over as often as the shift changes. The world that they work in often is fast tempo, decisions have to be made pretty quickly. They don't have the luxury of waiting around for a lot more information to come in. And some of the decisions are high risk. Often you're dealing with sustained operations, where people are fatigued. What does that have to do with emotional intelligence? And so one question is how does emotional intelligence relate to team performance and teamwork, and do some of these factors moderate that particular relationship? So is it more important in some domains that are characterized like this one is, compared to others? And I think it's important to know that for the job of collecting and training people for those domains.



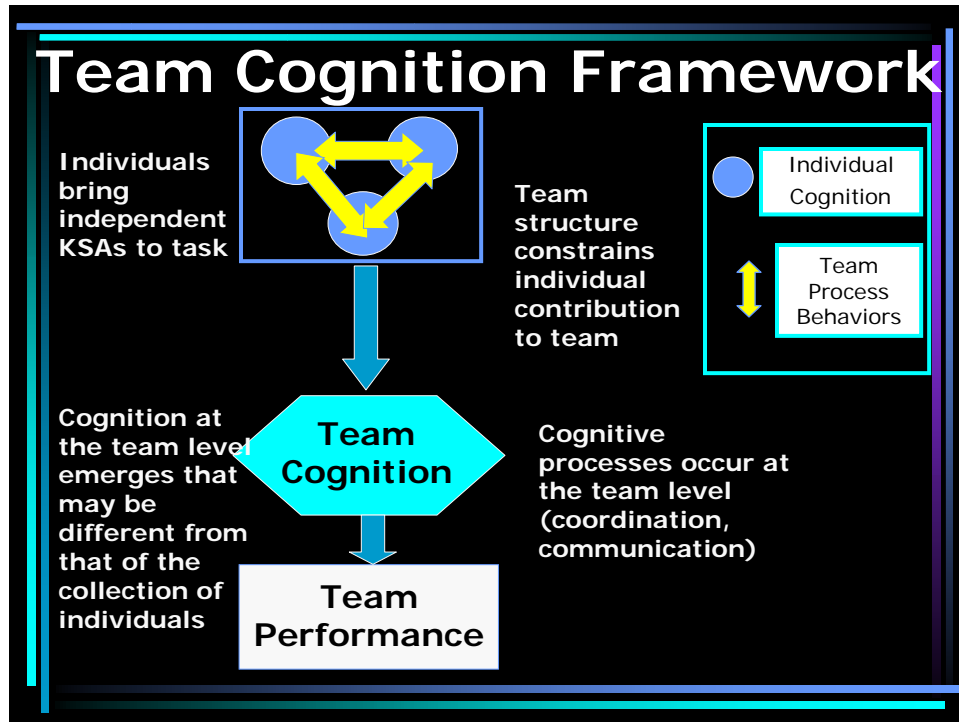
The last characteristic is that these tasks are highly cognitive in nature. Teams in these tasks plan, solve problems, assess the situation, make decisions, design, predict, all as an integrated unit. At least that's the idea, but they do this as an integrated unit. Sometimes it works, oftentimes it doesn't.



And so this raises the question, for me at least, as to what is this team cognition? You see these teams doing these cognitive activities as an integrated unit, they're planning as an integrated unit. Can you talk about something that is team cognition? And here's the way that we see it.



This is sort of our framework for defining team cognition, and it's sort of gestalt in nature. We see it as more than the sum of the cognition of the individual team members. So you don't take cognition from person A, B and C, and put it in a pot and sum it. Instead, it's something that emerges in a gestalt-like way from the interplay of the individual cognition of each team member and team process behaviors.



And another way of looking at that, individuals on the team – these are three individuals represented by three blue dots, they bring to the task independent knowledge, skills and abilities. Then, something that I'm calling team structure, will constrain each individual's contribution to the team; team structure being what the hierarchical situation in the team is like. Is there a leader, is there no leader? Do these teams each have different roles and is one person responsible for passing more information than another? Those kinds of structural issues will constrain each individual's contribution. These yellow arrows represent the process, so the sharing of information, coordination, communication; to me, cognitive processes that are occurring at the team level. So that's the processing of the information that each individual is bringing to the task. And then the cognition emerges at the team level and it's probably different than the cognition that is the collective cognition that emerges from the summing of the cognition of the team members. Why? Because not everything gets communicated, not everything needs to be communicated. And the whole purpose of having a team is so that individuals can have different parts of the pie.

## Team Knowledge

- ❖ Stable knowledge
  - Taskwork
  - Teamwork
- ❖ Fleeting Knowledge (i.e., momentary understanding, situation awareness, situation model)
  - Taskwork
  - Teamwork

I've also looked at, in terms of shared mental models, we've tried to unpack this concept, and we talk about team knowledge, and what is team knowledge. And just to give you an idea of how we break that down, we talk about the stable knowledge that each team member brings to the task, which could be about the task or about the team, and I think this teamwork knowledge is probably most associated with what we've been talking about here as emotional intelligence; that is, knowledge of the team members, the knowledge about how to work together on a team. But there's also fleeting knowledge about those same things and that's related to situation assessment, the knowledge that change is momentarily as fast as the situation changes, and in these highly dynamic and fast-tempo environments, this kind of knowledge is going to be hard to pin down.

## Team Coordination

**The essence of team cognition in command-and-control teams.**



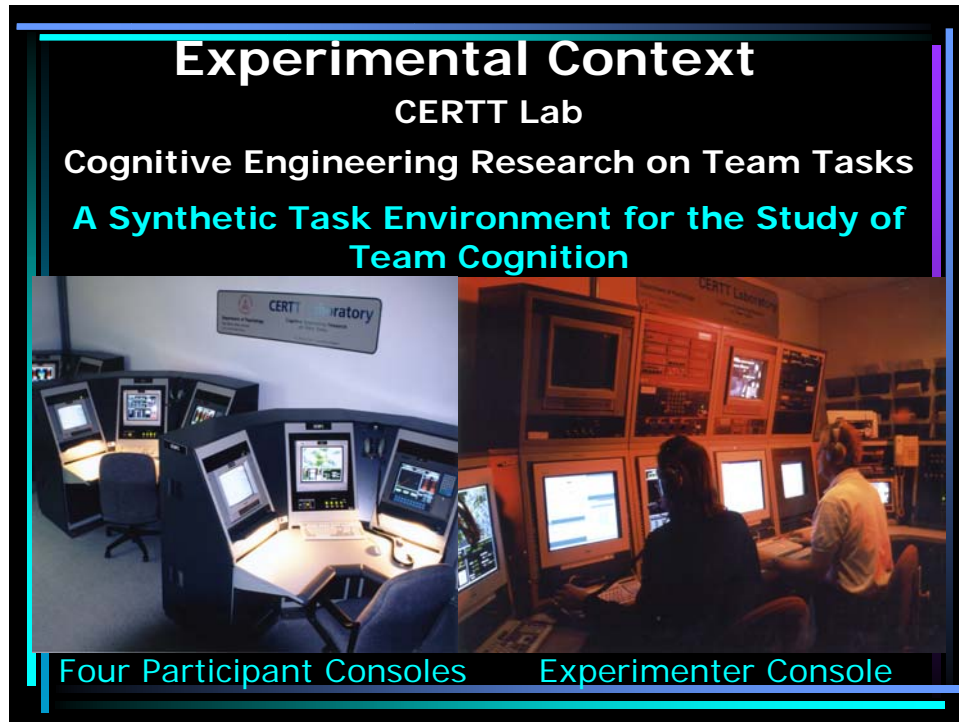
***Timely and adaptive information exchange among team members***

In these command and control teams at least, here is what we see as the essence of team cognition, it's team coordination. It's the timely and adaptive information exchange among team members. This is an actual picture of an airport incident command center and there's some really interesting dynamics that go on in passing information, and it's really interesting that the technology at these centers is not set up to deal with the actual task that's done. I'll just tell you a little bit about it. There's this really kind of cool table in the center that rises up to reveal lots of James Bond-like communication equipment that never gets used. But because it rises up from the top stands in the way of people communicating and seeing each others' faces. But that doesn't matter anyway, because they shouldn't really be in the same room, because they're talking to people on their cell phones outside of the room. So this is just an example of the types of command and control issues that we deal with, and so we see that there are coordination demands of the task that aren't being met at all by the technology.

## Other Related Work

- ❖ Group Think (Janis, 1972)
- ❖ Distributed Cognition (Hutchins, 1991)
- ❖ Common Ground in Discourse (Clark & Schaefer, 1987; Wilkes-Gibbs & Clark 1992)
- ❖ Group Decision Support (Fulk, Schmitz, & Ryu, 1995)
- ❖ Social Decision Schemes (Davis, 1973; Hinsz, 1999)
- ❖ Transactive Memory (Wegner, 1986)
- ❖ Shared Mental Models (Cannon-Bowers, Salas, & Converse, 1993)

Before I go on, I want to mention that there's also related work in this area. We didn't start the team cognition movement, but we've tried to look at ways mainly to measure it. There's been a lot of theoretical and empirical work done, such as our other work on group think, and distributed cognition, common ground and discourse, all of these are related. And again, I think there are some new issues that crop up when you start looking at these command and control teams that are slightly different than small groups. They have some interesting issues, which I'll get to. Now, what we've done in the area of team cognition, we've tried to bring the field into our laboratory by creating what we call a synthetic task environment, which is based on an analysis of the real command and control environment, which is the predator ground operations center out of Indian Springs. We went out and looked at that, abstracted from it what we considered to be the critical cognitive and team aspects of the task, and built those into a synthetic task environment in the lab. I don't recommend this research for anybody who is trying to get tenure or a Ph. D. by the way, because it's really time consuming and it's a big investment just to set up a synthetic task environment. But the purpose of doing this was to be able to study team cognition in a lab, to be able to observe the interesting features of the world at the same time. So it's a nice middle ground that we can hopefully get some experimental control over, but not lose a lot of the richness of the field.



So we have an experimenter console where observations are made, and we have participant consoles, and these participant consoles can get rearranged so that people can be co-located or distributed, which is one of the factors that we're looking at. But people in this setting are, there are three people playing the role of a UAV, Uninhabited Air Vehicle Ground Control Station, and they're all interacting over headsets, whether they're distributed or co-located, and they're in another room being observed by the experimenter.

So in our experiments there are three team members: the air vehicle operator or AVO who controls the air vehicle heading, air speed and altitude, the payload operator who is really the sensor operator and in the case of a reconnaissance mission they control cameras, and the DEMPC who's the navigator and planner. So this is the team. There are three people with three different roles to perform, but each has to work together to get the job done, which is to take reconnaissance photos of targets in a simulated task.

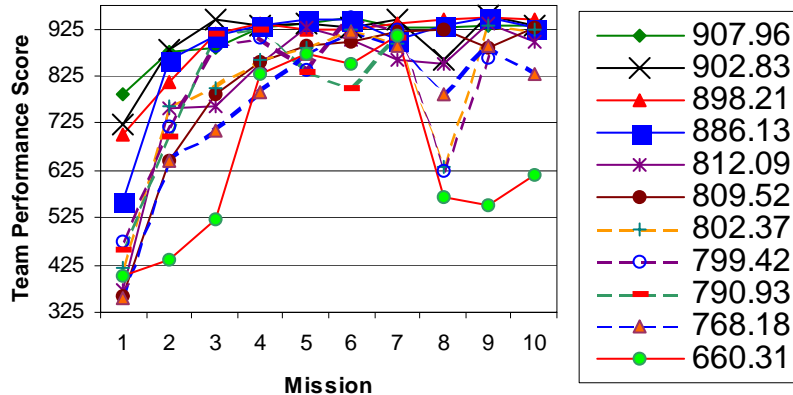
## **Current Task Context: UAV Ground Control**

- ❖ **Three Team Members: AVO, PLO, DEMPC**
- ❖ **Task: Maneuver UAV to take reconnaissance photos**
- ❖ **Experiments:**
  - **Six @ 10-20 teams each**
  - **5-10 40 min missions**
  - **Manipulate: knowledge sharing, workload, dispersion**
  - **Measure: performance, process, cognition of the team**

We conducted six experiments in the lab using 10 to 20 teams each. Again, this isn't to be recommended for anybody who wants to get tenure, because each team takes about two days to run and two experimenters to collect all of the data, not to mention the time to analyze it. But we run these teams in five to ten 40-minute missions. In our experiments we've manipulated things like knowledge sharing, workload, geographic dispersion, and we measure performance, process and cognition of the team, and those are really global, and they break down into much finer units. We have a composite measure of performance that's based on outcomes – basically how many pictures did they get and how many resources did they use in order to get those pictures, and we have performance has to be measured at the individual and team level.

## UAV Ground Control Experiment 1

Scores from completed missions for all teams



Just to give you an example of what our data look like, this is from our first experiment. These are team performance scores plotted over ten missions. One of the things that's pretty consistent about the data from all of our experiments is that teams improve over the course of about four missions. It takes them about four 40-minute missions to reach asymptotic levels of team performance. Now at mission one, they've already been trained on their individual tasks. They know how to be an AVO, a PLO or a DEMPCs. What is happening, we believe during these first four missions, is that they're learning how to coordinate. They're learning how to play well with others. And they're learning what information the other person needs, when they need it, and how to get it there in efficient fashion. You might wonder what's happening during missions seven and eight. Between missions seven and eight was spring break. Teams came back, sometimes it was a long lag of up to maybe two months, because it's really hard to get teams to show up in the lab and get them all to come back three at a time, and spring break sort of did it in some of these teams. We always have a bonus at the end for the highest point team. It obviously wasn't these teams at the bottom, so they probably had motivational problems. We're also doing some retention studies, because one of the interesting things is how long does this playing well with others skill not only develop, but how long is it retained. And here we have some evidence that it's not retained past a couple months.

## Some Findings

- ❖ Asymptotic team performance after 4 40-min missions
- ❖ Skill loss after 7 weeks
- ❖ Minimal effects of dispersion or knowledge sharing on team performance
- ❖ Dispersion has negative impact on team process and knowledge
- ❖ Increasing workload is detrimental to team performance
- ❖ Co-located DEMPCs perceive greater workload than distributed DEMPCs

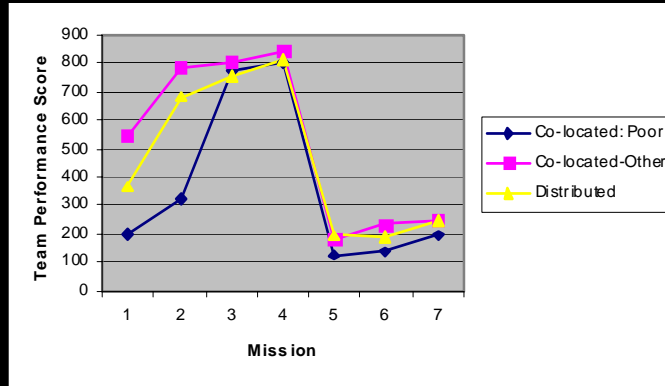
To run down some of our findings in general, like I said we find asymptotic team performance after four missions, skill lost after about seven weeks. And interestingly, we find minimal effects of dispersion, geographic dispersion or knowledge sharing, the ability to communicate with your team members on team performance. What's happening we believe is that teams are adapting to the situation, because dispersion does have negative impact on the team process. By that I mean it changes the way that they do their team process, it changes the way that they're playing well with others, and it changes the type of knowledge that they have about what the other team members are doing. It also changes their communication and we believe that that's one of the primary ways that they're adapting. Communication is very different, we're currently analyzing all of the data on that now. But it's very different in the dispersed condition from the co-located condition. Increasing workload from 9 to 20 targets and keeping it at a 40-minute mission is detrimental to team performance, and not just that they can't get all those targets, but that they actually slow down; the team gets fewer targets per minute, some indication that there's a little bit of pressure and maybe some stress. Co-located DEMPCs interestingly perceive greater workload than distributed DEMPCs. So if you have other people surrounding you, sort of like a social inhibition, if you have other people surrounding you, you feel the workload is more intense than if you're off by yourself somewhere.

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We have measured working memory capacity in a few of our experiments and we've also looked at gender competition. I'll show you that in a second. Working memory capacity is interesting. It's correlated with performance, but only for one of the roles, not for the team as a whole. If you have a DEMPC with a good working memory capacity, you perform well as a team. And here's something that I thought was interesting, especially for this group. We're currently running a benchmarking study, hoping to bring in actually UAV operators to the lab to try to find out how well the best teams would do on this task. We haven't been able to get too many UAV operators, because they are currently busy, but we have brought in other kinds of teams that we thought would be expert, maybe in a different way. Our highest scoring team so far was a team of three males that spent up to eight hours a day playing video games on the internet. I'm not sure what that says, but I do believe that they had what it took to be coordinated in this task. Instead of taking four trials to reach asymptotic levels of performance, they were there in one trial. And here's something that's also interesting that we weren't really looking for, but we found. In these experiments you also find that there's lots of variation, caused by all kinds of things that we weren't even thinking of.

## Team Composition and Team Performance

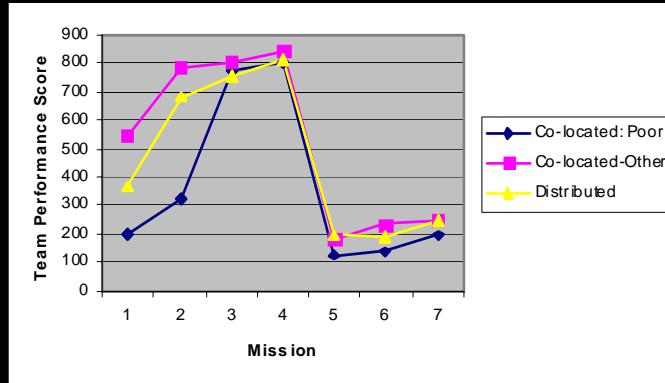


Team performance for distributed teams, three co-located teams (mixed gender composition and low working memory), and remaining co-located teams.

And here we were looking at the difference between distributed and co-located teams, and co-located teams are represented by this pink line and the distributed teams by the yellow line. You see it looks like there's just a little bit of advantage, but not significant for co-located teams. One of the interesting things is this blue line though. We had these three co-located teams that performed really badly, and they happened to be the only three teams that were mixed gender teams that also had low working memory. In general, we see that mixed gender teams and sort of mixed teams at any cultural level are not performing as well on this task as same gender teams. We don't really look at culture specifically, but we have done things because we started running out of our ROTC population. We started mixing ROTC students with fraternity people and rugby players, and ended up with some disastrous results.

I have some ideas now, some extensions to emotional intelligence based on some of what we've looked at, mostly with the idea of geographic dispersion. In talking about application, one of the things we can do in applications to teamwork is look at how we would do selection or team composition. Can we put teams together in a particular way to enhance team performance? So how do these various factors that I've talked about that are consistent with this domain, moderate the relationships between emotional intelligence and teamwork? So can we identify particular situations, particular jobs that would be particularly poorly suited for people of low emotional intelligence? Or for teams that have a low emotional intelligence DEMPCs, for instance?

## Team Composition and Team Performance

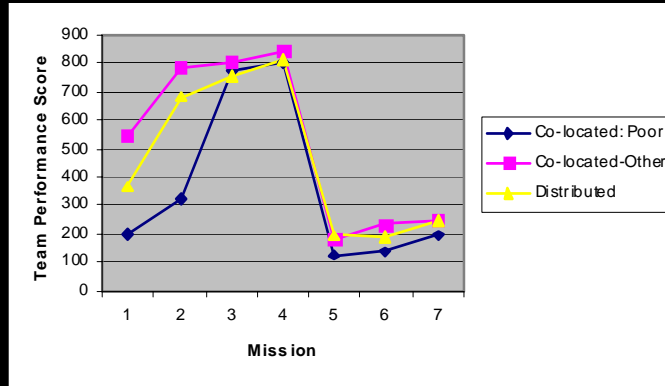


Team performance for distributed teams, three co-located teams (mixed gender composition and low working memory), and remaining co-located teams.

And this also came up and when I was listening to one of the very first talks, if we can remember that long ago, Ben Ze'ev's talk, I was wondering if we can draw a connection between love and war here and look at dispersion. Does dispersion actually makes the heart grow fonder in network centric warfare? But here you have teams of people that are dispersed, kind of like a cyber relationship. Does that make the team more cohesive, the fact that they can't see each other face to face? I'm not sure. I'm not sure that this transfers to network centric warfare, but it's an interesting question.

Another interesting question has to do with team training, and this has been addressed several times even in the context of this particular session. Can team members be trained in emotional intelligence? I think that's an important question and I know that a lot of the team building exercises that are currently going on in the military and elsewhere may get at some of that, but it's not been specifically directed to emotional intelligence. And I also wonder about the role of dispersion in training teams. What about learning to play well with others from a distance? There's a big move now because of network centric warfare to do distributed mission training. Training teams in that context is going to train them to play well with others in that context. Will it transfer to a context where you have people working together face to face?

## Team Composition and Team Performance

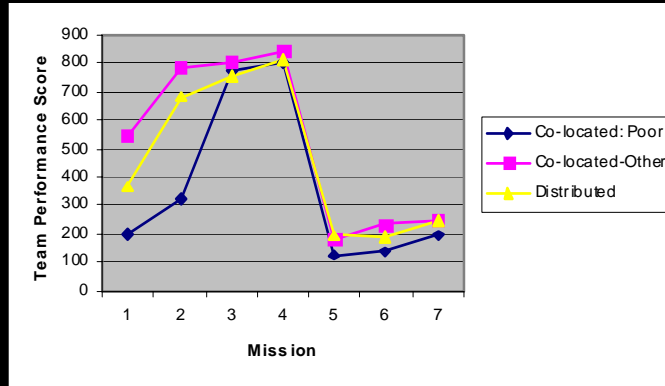


Team performance for distributed teams, three co-located teams (mixed gender composition and low working memory), and remaining co-located teams.

Going back to some of the earlier talks today about children, I wonder how dispersion and learning to play well with others over the internet affects the emotional intelligence of children. I've been talking to a few people here about the difference between my generation and what we did when we were growing up and there wasn't an internet, where we had to go outside, and find friends, and find things to do, and actually play in the neighborhood, and kids who only go outside to get in the car to go to soccer practice, and most of the time are inside playing with friends in the virtual neighborhood of the internet. What does that do to emotional intelligence and learning to play well with others? And how does it scale up to situations where you might find in the workplace where you're not on the internet now, you're face to face with this person. How do you even know how to read or express emotion when you haven't had to do it face-to-face? So I think there's a lot of interesting questions there. And then another question about design. How can we design the test environment or technology in terms of decision aids, an agent to facilitate emotional intelligence? So I think we need to answer all of these questions. These are all unknowns.

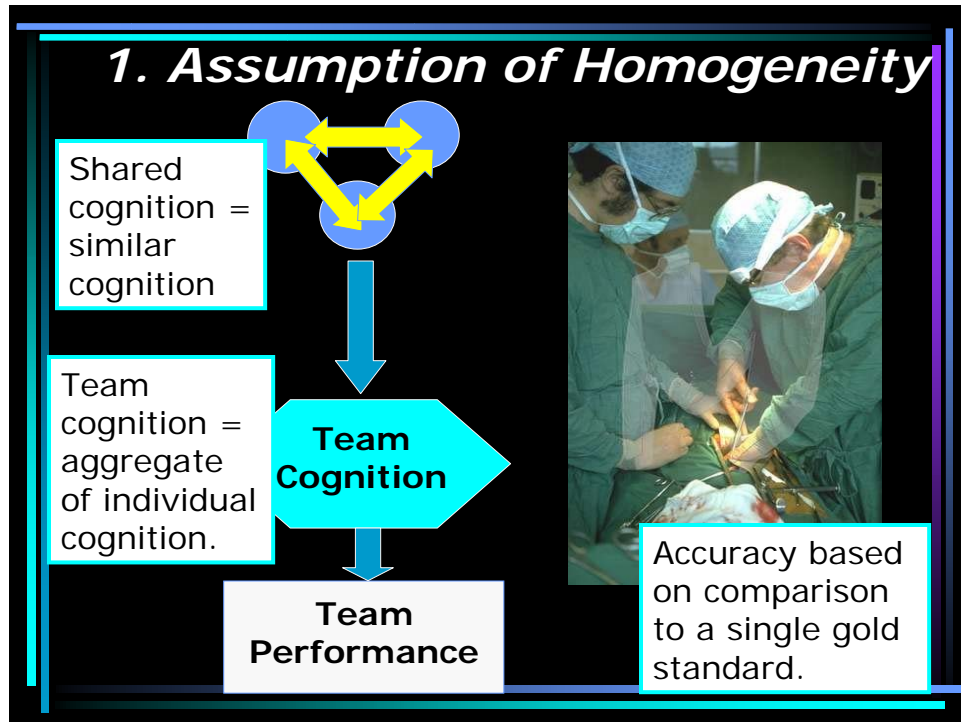
I want to get into some assessment issues. I talk about team cognition and teams having cognition. What about team emotion? Can we think the team is having emotion? Can a team be characterized as having high or low levels of emotional intelligence? Maybe. I could appeal to folk theory and say well we talk about the angry mob, and the happy family, and the elated team, so maybe a team could be characterized as having some kind of emotion or maybe mood, and maybe a team could be characterized because of emotional intelligence.

## Team Composition and Team Performance

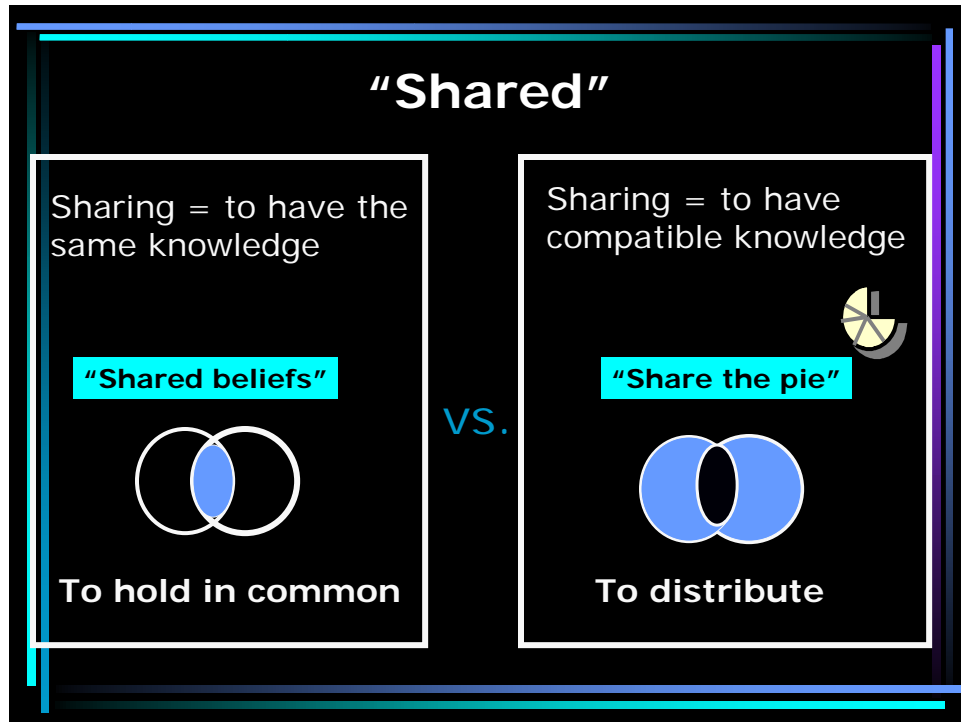


Team performance for distributed teams, three co-located teams (mixed gender composition and low working memory), and remaining co-located teams.

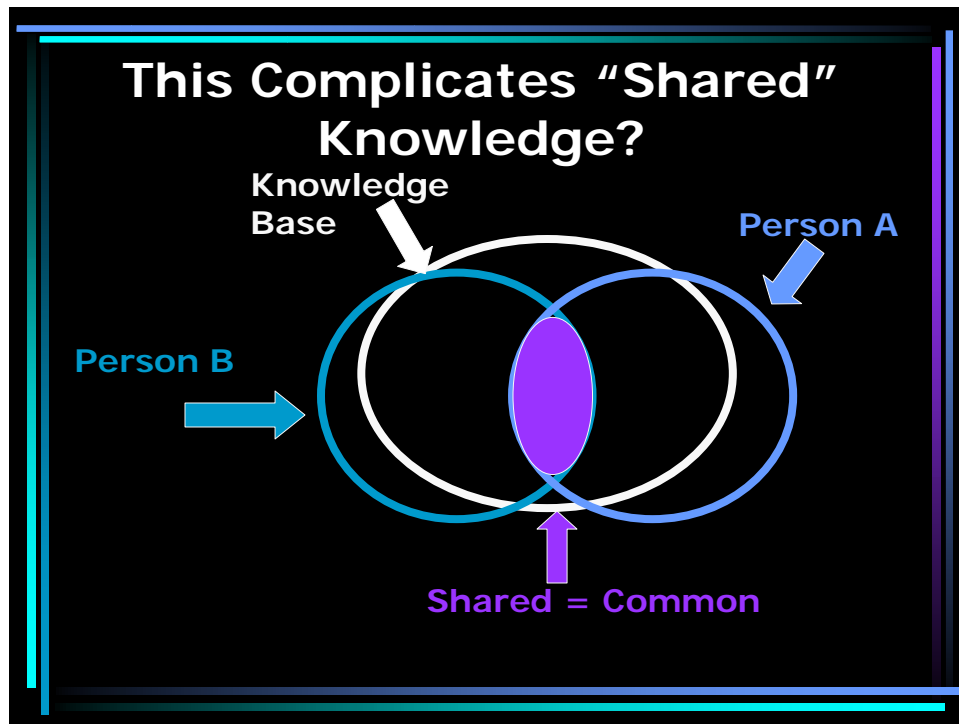
Now in trying to do this with team cognition, I ran into several challenges and here's two of the main ones, and maybe they would apply to doing the same thing with team emotions. Shared mental models were heterogeneous, and people talk about shared mental models in team literature a lot, and on the surface they mean if you know what I know then we have a shared mental model. If you believe what I believe we have a shared mental model. When you start talking about heterogeneous teams, like operating on teams where you have a physician, a surgeon, a nurse, an anesthesiologist, it's not clear that they should all know the same thing. Parts of the same thing, maybe. So what does a shared mental model mean in that context? And the other issue is how do we get; how do we measure or assess team cognition or emotion? Do we just do this simple aggregation, and that's probably not efficient.



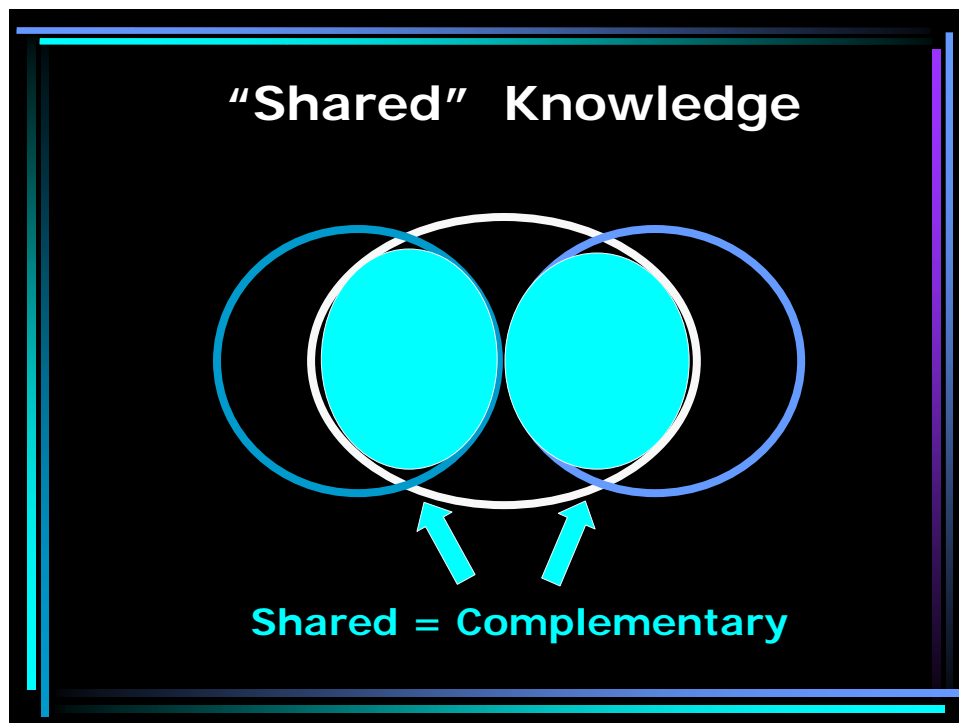
So this assumption of homogeneity is that shared cognition means similar cognition, or that team cognition is the aggregate of individual cognition, or that we can judge the accuracy of the team member based on a comparison of that team member's results on some test to some single gold standard. So the nurse takes the same test that the surgeon does. Part of the problem here is in the word shared. Shared has at least two different meanings.



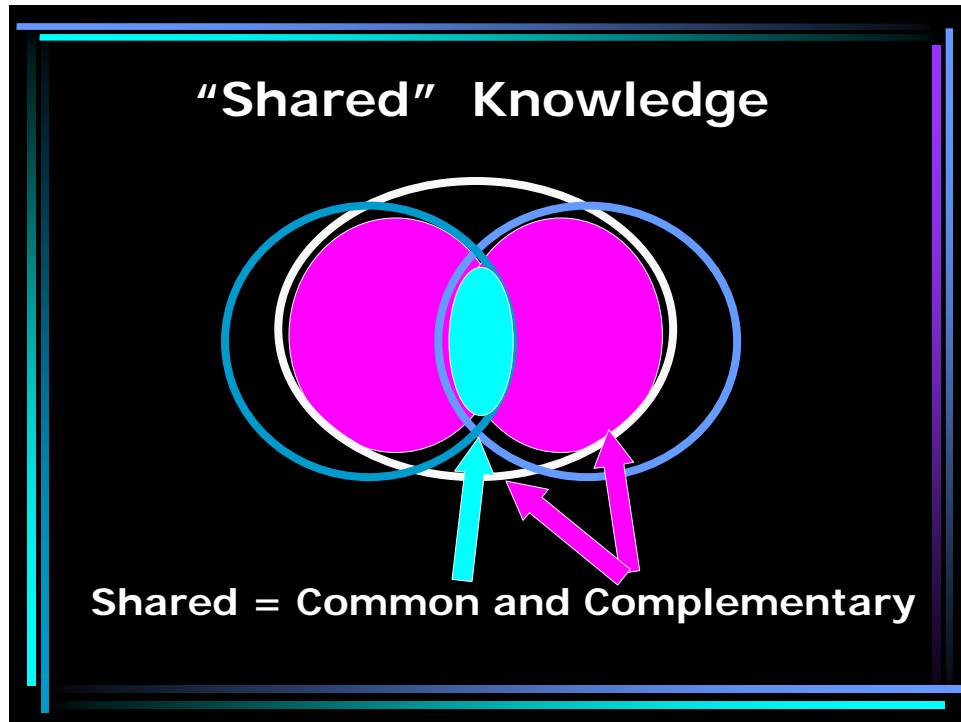
Shared meaning hold in common, where I have the same beliefs that you do, or shared meaning distributed, I have some of the beliefs, some of the knowledge, you have some of the knowledge and we share some. Which is most often the case probably in the teams that we look at, that there is some knowledge that people have in common, there's some knowledge that is complimentary.



Most of the time there's a combination of common and complimentary knowledge ...



So that's really the picture when you're talking about shared mental models with shared knowledge. So what would it mean to measure that?



We've done a little bit of work on trying to measure shared mental models in terms of what people know about their task. We've used factual tests like a multiple choice test, and I don't know if I should say this here, but they didn't work very well, it was a little bit too obvious.

## Eliciting Taskwork Knowledge

### ❖ Factual Tests

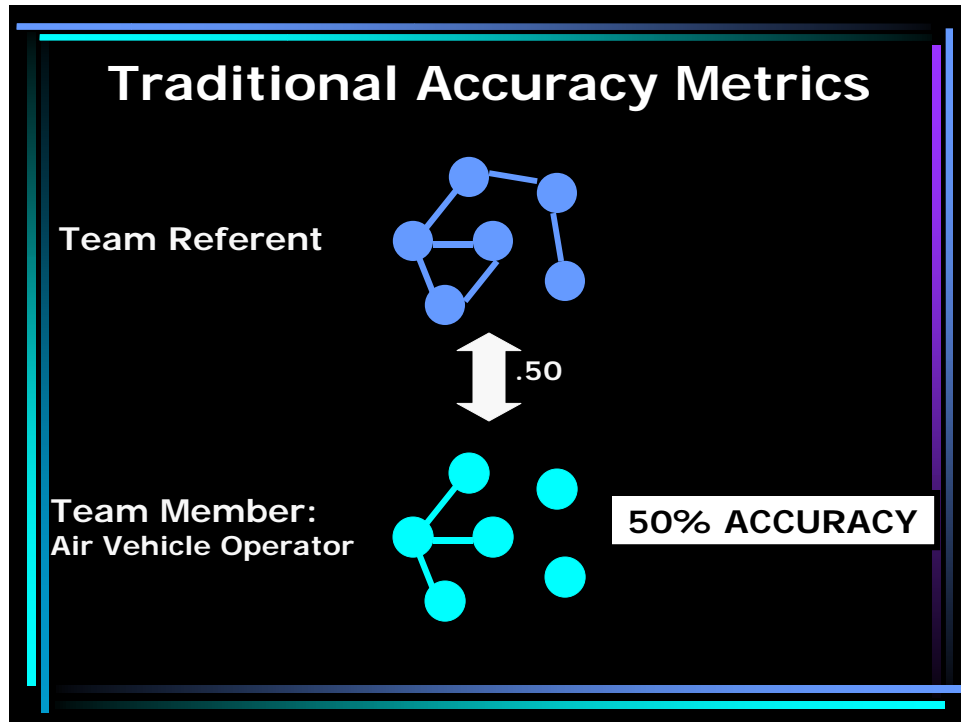
The camera settings are determined by a) altitude, b) airspeed, c) light conditions, d) all of the above.

### ❖ Psychological scaling

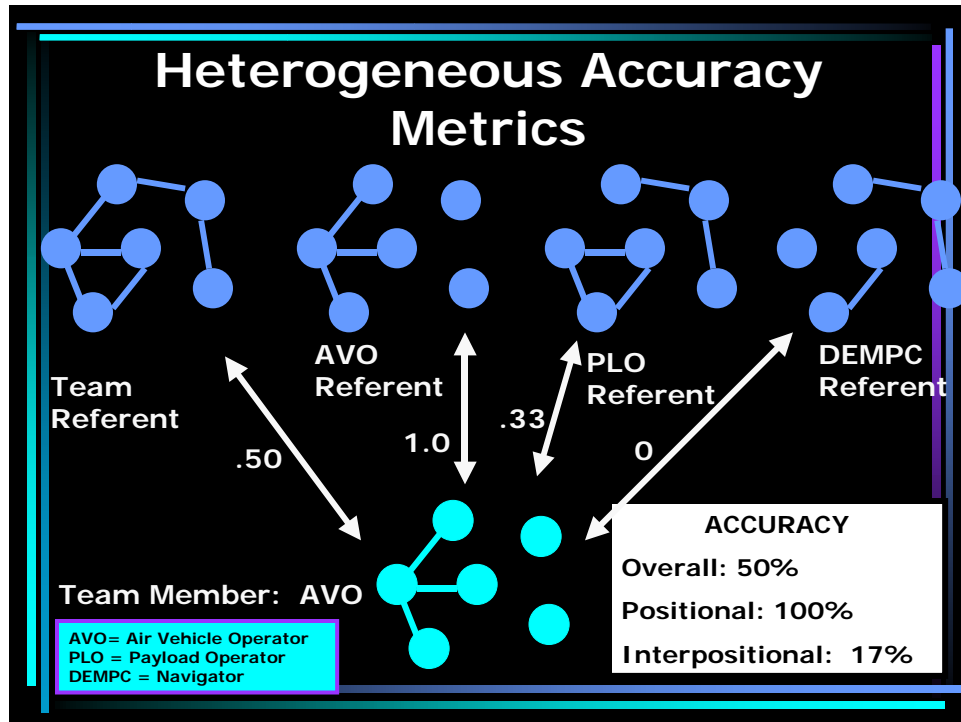
How related is *airspeed* to *restricted operating zone*?

### ❖ *Also teamwork knowledge and situation awareness*

The better test was a test using psychological scale and relatedness estimates of concepts that were task-work related, such as air speed and altitude. How similar is air speed and altitude? We used multidimensional scaling, or pathfinder network scaling to analyze those data, and we can compare each person's pattern to a gold standard or reference representation. And that's what typically would be done looking at shared mental models.



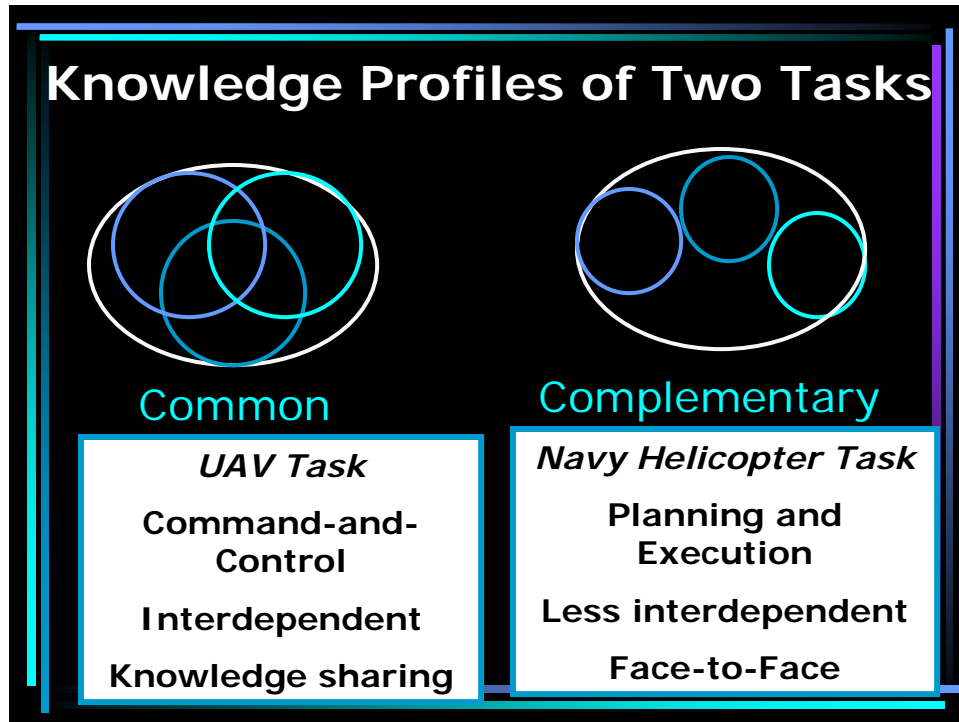
You'd get this air vehicle operator's representation of knowledge, compare it to a team referent and say well they know 50% of the material.



What we decided to do, making it a lot more complicated, but not only looking at it from the team referent point of view, but comparing the AVO's knowledge to an AVO referent, PLO referent and a DMPC referent. So assuming that each role on a team is associated with different stuff to know, how much does that individual know about all of these different roles? And by doing that, we can get an estimate of how much they know about the team task as a whole, overall accuracy. We can get an estimate of how much they know about their own role, positional accuracy and inter-positional accuracy, how much they know about the other two roles.

Knowledge Profiles of Two Tasks			
Knowledge profile characterizing effective teams depends on task (UAV vs. Navy)		Knowledge Profile	
	Knowledge metric	Common (UAV)	Distributed (Navy helicopter)
	Overall accuracy	+	0
	Intrateam similarity	+	0
	Positional accuracy	+	+
	Interposit. accuracy	+	0

When we do that, we find that we can characterize tasks on the basis of the knowledge profile of, for instance in our UAV domain, teams that are effective performers have team members who have good overall accuracy. They are similar in terms of what they know, they have high positional accuracy. They have shared knowledge very much in the common sense of the term. In another Navy task that we looked at before we had our simulation in place, we found that nothing really mattered except positional accuracy. Positional accuracy of each individual, what you know about your own role was correlated to effective team performance. So here's what the picture looked like.



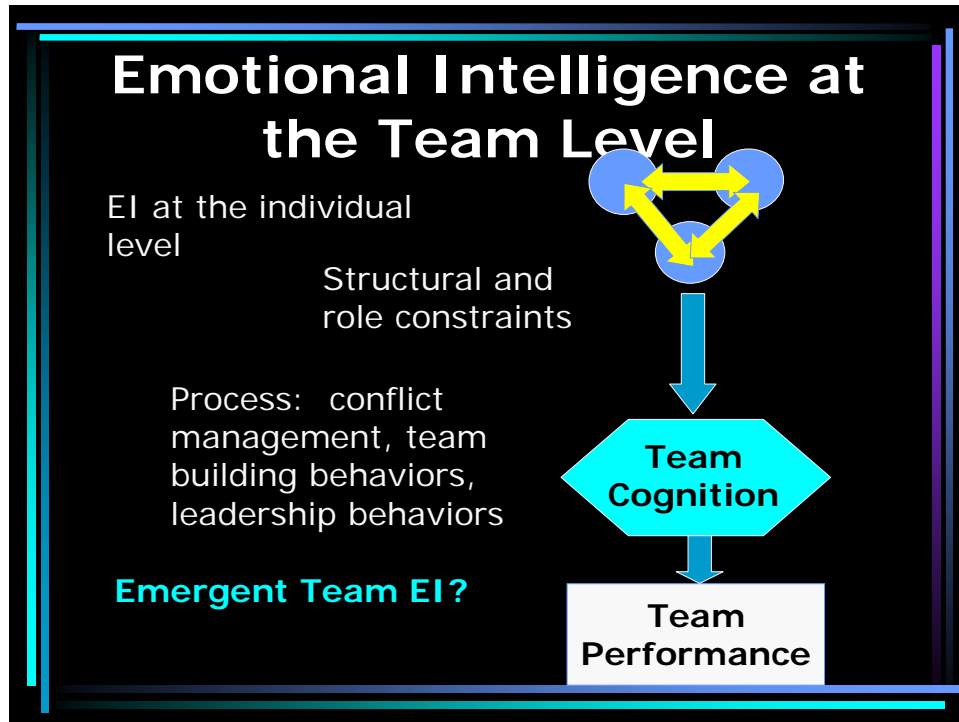
Just another way of looking at it, but the Navy task, the helicopter task, which was really a little bit less interdependent seem to require more specialization of knowledge than the UAV task.

## A Cross-Training Study in Retrospect

- ❖ Examined effects cross-training vs. other training regimes on team performance and cognition
- ❖ Unlike previous studies, cross-training had no performance benefit
- ❖ Cross-training, did increase interpositional taskwork and teamwork knowledge
- ❖ Perhaps knowledge profile for that task (specialization) was at odds with cross-training
- ❖ Demonstrates benefits of assessing team cognition

And just a quick anecdote here. We ran a cross-training study with some people at the University of Central Florida to look at the effect of cross-training compared to other kinds of training regimes on team performance and cognition. Most of the time we find that cross-training is a good thing. Unlike previous studies, cross-training had no benefit in this Navy helicopter task. It did increase their inter-positional task work and teamwork knowledge when you cross-train them, but it didn't have any effect on performance. Perhaps that's because, and this is going backwards, it's a post-talk explanation, but perhaps that's because the task was one that required specialization more than having a common shared mental model. And I think it really demonstrates the benefits of looking at knowledge in this way.

Also, I just wanted to remind you that we found in some of our studies that working memory capacity is related to team performance, but the correlation is specific to the team role. So there are more complicated relationships between knowledge and performance when you're looking at teams that are heterogeneous like these command and control teams. And what could be some extensions to emotional intelligence and the role of team structure? You could think of people as coming to the task with emotional intelligence at the individual level, and then perhaps there are structural and role constraints on the application of that emotional intelligence to teamwork. Perhaps for some individuals on the team, emotional intelligence is highly important and for others it's not. There are some people that need to be people-people on the team and others that do not. Maybe they also self-select to be in those roles.



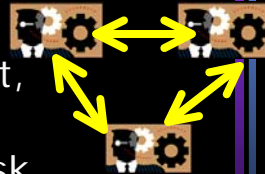
And then there's process that happens, conflict management, team building behaviors, leadership behaviors that integrate that emotional intelligence to maybe something that emerges like a team emotional intelligence.

In the interest of time skip over these collective holistic metrics, but we've done something else to try to get more of a holistic type of team cognition, which is to elicit knowledge at the team level, and that's had some mixed results, which is a good reason to skip over it.

So, some of our special challenges in operational environments are that we don't want to ask people to give us hundreds of relatedness ratings, or answer surveys in the middle of doing their task. In the operational environment, we'd like to be able to assess performance and cognition online in an embedded way. And to do that we've been looking at communication analysis as a method of assessing team cognition online. And I believe that this could be also useful at getting at team emotion in an online and embedded way, much like some of the other kinds of metrics that have been discussed here earlier in the week.

## Properties of Team Communication

- ❖ Observable; Think aloud “in the wild”
- ❖ Reflects team cognition at the holistic level; is team cognition
- ❖ Rich, multidimensional (amount, flow, speech acts, content)
- ❖ Real-time, embedded in the task




And these are the properties of team communication. It's almost like a think aloud in the wild that occurs naturally. Teams, in our cases at least, naturally communicate. It's very rich and it's in real time, it's embedded in the task, so you have a rich source of streaming data.

## *However...*


- ❖ Labor intensive transcription and coding

*Communication data*



*Time spent talking*

- ❖ Analyses do not fully exploit data (e.g., dynamic, sequential aspect)

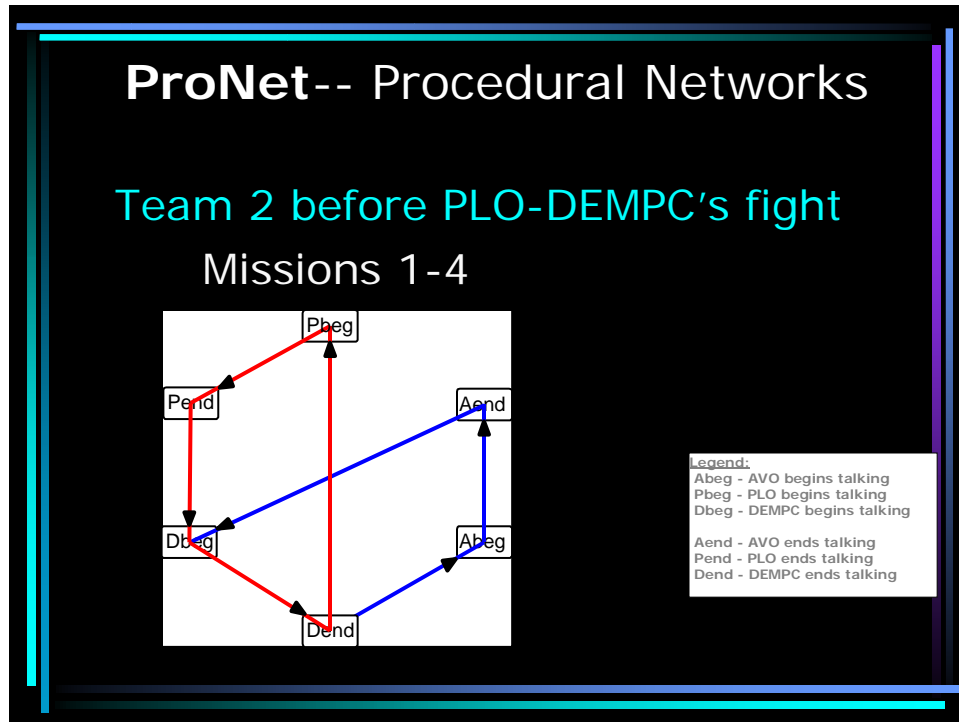


But the problem is, if you've ever dealt with it, it's very labor intensive. It's not at all automatic, you have to have somebody transcribe it, and we have lots of undergraduates doing this, and you're still not able really to fully exploit the richness of the data. So we've been working on ways to automate this.

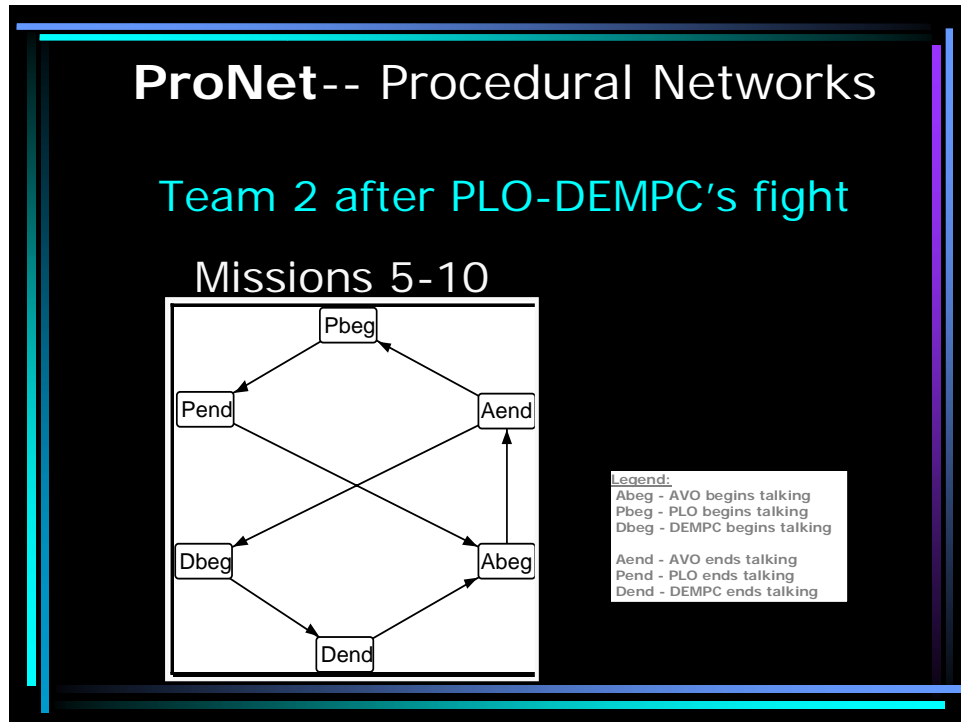
## Automating Communication Analysis

- ❖ Communication Flow Analysis
- ❖ Content Analysis Using Latent Semantic Analysis

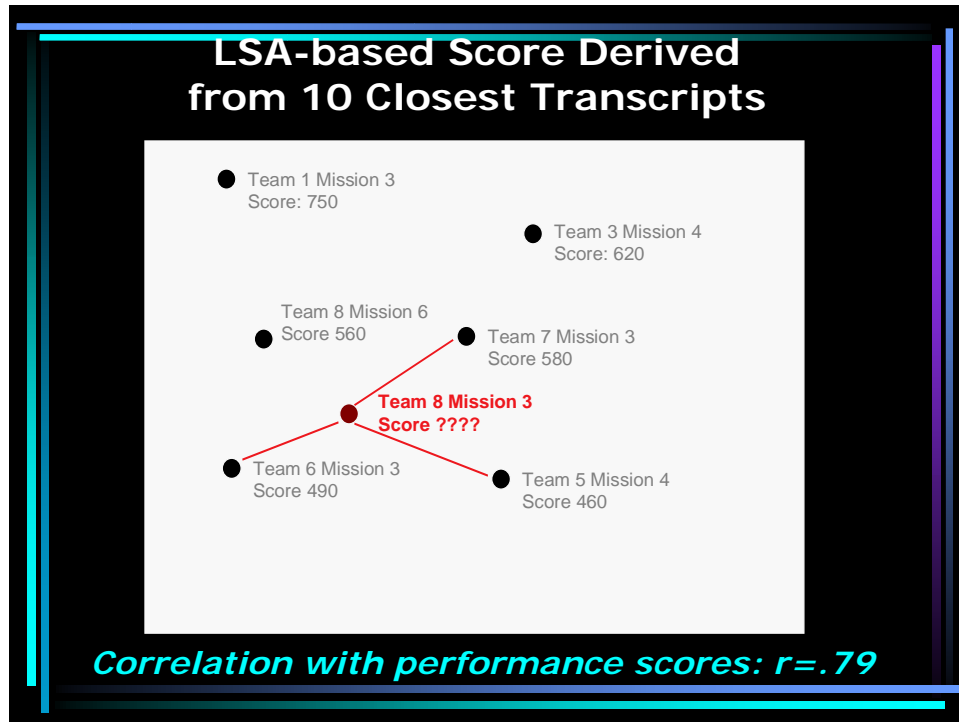
We're primarily looking at two aspects of the communication data – the flow of communication from one individual to another and also content analysis using latent semantic analysis.



Here's some examples of what we do with flow. We use several different techniques, this is a technique called pro-net, I'll show you the pattern. And here XXX in this particular network, we have the three individuals – P means PLO, A AVO, and D DEMPC, either beginning or ending a speech segment. And you can see there's sort of loops here where PLO talks to the DEMPC and the AVO talks to the DEMPC. Well on this particular mission, or set of missions, that's the way it worked. And then at one point, the PLO and the DEMPC had a big fight, there was conflict.



And here's what we see after that, the PLO and DEMPC don't talk to each other anymore. They only go through the AVO now. And so we can see this change in team communication reflecting something else that's going on in team process. And it might be an interesting way to get at this idea of team emotion.



I don't have time to go into a latent semantic analysis, but we have been using it and it's basically based on singular value decomposition and feeding in lots of documents to LSA to kind of learn the semantic relationships among a set of words, and then we can feed our already transcribed transcripts from our team into a latent semantic analysis and try to predict scores based on how similar a new transcript is to a transcript in our database that had already been scored, and we're able to predict performance scores, .79, which is pretty good. And so extensions to emotional intelligence, possibly this could be used as a barometer of emotional intelligence. And to summarize, here's our knowns.

Summary	
<i>Challenges of Assessing Team Cognition</i>	<i>Some Responses to Challenges</i>
❖ Assumption of Homogeneity	❖ Heterogeneous Accuracy Metrics
❖ Limited Aggregation	❖ Principled Aggregation Procedures
❖ Individual Elicitation	❖ Holistic Elicitation
❖ Operational Environment	❖ Communication Analysis

It's nothing to write home about. I think that we know that teamwork and emotional intelligence are related. But what we don't know is a much lengthier list. We don't know what the explanation is behind that relationship, what's the mechanism that's causing emotional intelligence to impact teamwork and then team performance. What are the effects of these various factors like geographic dispersion on this relationship? And what's the role of team structure, such as having a leader, not having a leader, different roles on the team? Is there such a thing as team emotion? Is it something that's holistic? Can we measure it in a holistic way and what communication patterns do we impart to do that?

## Implications & Applications

- ❖ Facilitating team cognition through training or technology
- ❖ Selecting/composing teams for optimal collaboration
- ❖ On-line monitoring of team cognition in high-risk environments

Finally, to some implications and applications of this line of work. I think that a lot of this work that has been presented here this week could be used in this area to help select and compose teams to have optimal emotional intelligence, and hopefully that would lead to optimal performance. Also to facilitate team emotional intelligence through training or technology, and the way that we're going with our communication analysis is to do online monitoring of team communications, and in this case it could be online monitoring to assess team emotion in high risk environments. Could we use the communication analysis as a barometer to say this team is experiencing stress or conflict right now? We should maybe step in and do something about it without being annoying. And that is it.



## DISCUSSION

**DR. KYLLONEN:** The team task is in a way it's a little bit like the tutor task that Lewis Johnson was talking about yesterday, because the tutor has to decide when to intervene in the same way a team member has to decide when to intervene in order to get information. And you remember from that talk, he talked about the politeness.

**DR. COOKE:** I'm afraid I missed that talk.

**DR. KYLLONEN:** Okay. I'll summarize it. He found that politeness and attentiveness were important. And so he had some kind of rules or some heuristics for identifying when to intervene that indicated that you were attentive to conversation, and also how to phrase things in order to basically not make the other person embarrassed or to lose face and so forth. But what was interesting was, was that there were some words and expressions and so on that you could presumably use; I didn't understand exactly what you were doing with LSA, but this would be a sort of an alternative to using EI in general, but you're using specific kinds of features, I mean the specific components, like the attentiveness and politeness components. And you would analyze your verbal protocols not just in terms of how similar one packet of materials is to another, but whether you have these specific indicators. Someone might be violating some of these rules and thereby predict team performance breakdowns and so on. In other words, a person is insulting the other person, or they're being impolite, or they're ignoring the other person, not showing indications of attentiveness and so forth.



**DR. COOKE:** We're doing a lot with LSA in terms of coding our transcripts. Our codes have to do with acknowledgements, questions, statements. So you're basically training LSA on what is an acknowledgement, what is a question, what is a statement. I think you could do the same thing with what is an insult, what is a polite statement, and so we could then automatically code the incoming communication in terms of, oh, here's an insult. Better check that out.

**DR. GADE:** A couple of related questions. In your face-to-face situation, were they able to stand up and talk to one another and did they do that?

**DR. COOKE:** Pretty much during their missions they were seated. They could turn and see each other. If they strained a little bit, they could see the other screens and during breaks they could stand up and talk to each other, and indeed during breaks they usually would stand up, walk around, often look at each other's screens. And we suspected originally, seeing that behavior in other experiments, that that would have a big effect on team performance not being able to do that. So we were kind of surprised when in two experiments it really hasn't.

**DR. GADE:** Did you find that there was – this may require you kind of thinking back on this – was there more emotional behavior in the face-to-face situations expressed? And were they less likely, for example, the example you showed in the communication where the two stopped talking to each other. Is that more likely to occur in a face-to-face situation?



**DR. COOKE:** That's a good question and I don't know that I have the data on that right now. We did have experimenters making observations. They had the general sense that people enjoyed the co-located situation much better than the distributed or dispersed situation. I think that the particular event that I showed you happened to a co-located team.

**DR. SAUCIER:** With both the co-located and the distributed experiments that you did, did you capture any of the team process or code any of the communication that happened in between performance episodes, so in between the missions? So when they were walking around on the breaks, did you capture any of that and what they were doing then? Or were you only capturing the kind of in process components?

**DR. COOKE:** That's a good question. I believe we did record some of this after-action review stuff that they did for the five minutes after the mission. Then when they got up and went on their break, we didn't follow them around with a recorder, so we didn't have any of that. But we did have experimenters watching what they did and they did talk to each other about the task.

## emotion and aging: an information processing perspective



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Emotional Intelligence Workshop  
November 15, 2003

### EMOTION AND AGING: AN INFORMATION PROCESSING PERSPECTIVE

**DR. ISAACOWITZ:** In the interest of time as this is setting up, let me tell a little anecdote that, I think, will frame some of the things that I'm going to say today. When I first moved to Philadelphia for grad school, I was reading the *Philadelphia Inquirer*, which actually is the reputable paper in Philadelphia – not the *National Enquirer* – and there was an interview with a man who had just turned 100 years old. And actually he was on the front page of the paper, and the entire piece of it on the front page was all about all these problems that he was having as a 100-year-old man, and the interviewer was asking question after question about this problem the guy's having, and this terrible thing, and that terrible thing. And you had to sort of keep going, and read through the rest of the article, and continue through into the actual "A" section to get the rest of the interview. So more and more, you keep reading more and more problems, and the guy's kvetching, and it was sort of unbelievable. Last question the journalist reports having asked, "Okay, we've covered all the problems. What would you say is the one best part about being 100 years old?" And as the reporter writes, the 100-year-old man paused for a second, looked at him and said, "No peer pressure."

I'm going to try to talk today about what we know about emotion and aging, and I'll present a particular perspective on emotion and aging focused on information processing.

**Proceedings from the ETS & ARI Emotional Intelligence Workshop**  
Session V: Applications



I first want to acknowledge the members of my research group as well as support from the National Institute On Aging.

## plan for the talk

emotion and aging: physiology, control

affect and aging

self-report

experience sampling

socioemotional selectivity theory

the role of cognition

eye tracking

aging and emotional intelligence?

And just to give you a game plan for the talk, I'm going to first speak very briefly about the little research that is out there looking for this classic emotion stuff in the context of aging. Then I'll talk about the somewhat more research that exists on affect in aging. And then I'm going to frame that research by presenting socioemotional selectivity theories as a way of accounting for the affect and emotion findings. Then I'm going to talk about the role of cognition in these relationships, taking a detour into recent work I've been doing using eye tracking. And then at the end I will try to take up this issue of aging and emotional intelligence.

## emotion and aging

Levenson et al. (1991): emotion-specific physiological responses maintained, some decline in magnitude  
control: Gross et al. (1997) – at least by self-report, older individuals show better emotional control  
depression: older have low rates, according to ECA (Regier et al., 1988)

So what do we know about emotion and aging? There's not much out there, but there are a few things. In a study looking at psychophysiological aspects of emotion, Levenson and colleagues in 1991 found that indeed the psychophysiological profiles that they find to distinguish emotions in young people, those differences are maintained in older people. There's some decline in the magnitude of the psychophysiological responses, but in general, stuff looks similar when you look at the psychophysiology of emotion in older compared to younger adults. Using various self-report measures of emotional control, James Gross concluded that at least by these admittedly limited self-report measures, older individuals were reporting, showing and using more emotional control than their younger counterparts. And what really sort of got this whole line of inquiry kick-started was the somewhat surprising, to many, finding from a large epidemiological study of psychopathology in America, that older individuals 65 and over, this was a huge representative sample, they didn't have the lowest rates of major depression of any age group, they actually had the second lowest rates. The lowest rates were in children under the age of seven. Do what you want with that finding. There's much more research out there looking at affect in the context of adult development and aging, and much of it is cross-sectional and much of it is self-report, but I think you'll see it sort of leads in one very strong direction.

## aging and affect: cross-sectional self-report

Malatesta & Kalnok (1984): more similarities than differences

Lawton et al. (1992): older individuals report less surgency, more control of feelings through moderation

Mroczek & Kolarz (1998): good news for affect in midlife; older report higher PA and lower NA

Isaacowitz & Smith (2003): not quite as good news for affect in very old age; no unique effects of age on PA, NA

The earliest study on affect in aging using cross-sectional self-report measures was Malatesta and Kalnok in the '80s, and they expected to find lots of differences in people's self-reported affect across the adult lifespan, and they found more similarities than differences. Powell Lawton followed up that research with another self-report study in which he asked younger and older individuals in somewhat more detail about the quality of their affective lives. And he found, first of all, like Malatesta, that there was a whole lot of similarity. There were not many age differences to be found in self-reported affect. Where there were age differences, were in older individuals who were reporting less sort of exciting positive emotions. This is the entirety of the lifespan developmental consideration of a circumplex model. This is as close as anyone's ever gotten. There were these differences such that older people were saying, "We're sort of avoiding high arousal positive stuff." So the Lawton finding suggested that age differences that did exist were that older people were using a more sort of moderation-based affect regulation strategy, avoiding stuff that was at risk of high activation and staying in the more sort of content, pleasant emotions.

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Just a couple years ago, this study got a lot of press attention using data from the McArthur network's large representative sample of midlife adults in America. The sample actually ranged, I should note, from age 25 to 74. That's a big definition of midlife, but it was nonetheless a representative sample given that age span. And what they found was quite good news in terms of affect in the age span from 25 to 74, controlling for a whole host of other variables – demographic, contextual, personality variables, that have been linked to affect. The authors found that once you controlled for all of those things, you still found unique age effects on positive affect and negative affect, such that the older individuals in the sample were reporting more, higher levels of positive affect and lower levels of negative affect, than their younger counterparts. Again, this age range was 25 to 74. So this was taken as quite optimistic news about affect as individuals progressed throughout middle age into early old age. More recently, I did some work using the data from the Berlin Aging Study, which is a sample of individuals aged 70 to 100, trying to see whether we could extend the Mroczek and Kolarz's finding. And the news wasn't quite as good as it was with midlife Americans, but it wasn't bad either. What we found was that once you controlled for that whole similar host of well known predictors of affect – contextual, demographic, personality – we found no unique age affects in this very old age group. So whereas Mroczek and Kolarz found things seemed to be getting better, this unique effect of age relating to more happiness, we found no unique effect of age. And given all the things that are happening when people are in their 80s and 90s, that no effect of age I think is pretty impressive.

## affect and aging: longitudinal self-report

Generations study (Charles et al., 2001)

less NA with age, except high N

A couple years ago, Susan Charles published what really is the best methodological attempt to grapple with these issues using data from the Generations study at the University of Southern California. This is a great study, because it's a cross-sequential study, individuals have been followed longitudinally for up to 20-something years, and it follows members of families, so every time there's a new generation born, they're brought into the study. So it has been able to look at to some degree longitudinal effects, look at the role of cohort effects as well. And the gist of that data is that everybody seems to be experiencing less negative affect as they get older, and this is consistent across both the cross-sectional the longitudinal analyses. There are, however, one major subgroup of people who do not seem to derive the benefit of time on their levels of negative affect and these are people who score high in neuroticism. I'll come back to this a little bit later; the interpretation here is that everybody is learning from experience that things aren't as bad as they think they will be, except people high in neuroticism.

## aging and affect: experience sampling

Carstensen, Pasupathi, Mayr, &  
Nesselroade, 2001: Beeper Study of  
affect and aging  
no age differences in PA  
older adults less frequent NA (to age  
60)  
poignancy?

In an attempt to add to this literature that had focused so much on sort of one time administration self-report measures, Laura Carstensen and colleagues conducted an experience sampling study similar to some of the other ones we've heard about, where individuals from age 18 to 94 were beeped five times a day over the course of a week, and they reported on their levels of positive and negative affect at each time they were beeped. They found no age differences in either the frequency or intensity of positive affect. But they did find that older people were reporting negative affect less frequently, but that was only the case up until age 60. And perhaps the most important part of this data actually was not about relative levels of positive and negative affect at all, it had to do with the relationship in any moment that you were beeped between your level of positive and negative affect. And in general what they found in this study was that for young adults, they either were having one or the other. The positive and negative affect were independent, uncorrelated. For the older subjects, there was much less independence of positive and negative affect. Older people were more likely to report at any moment that they were beeped being in a more mixed affective episode, not purely positive or negative, but had more mixed positive and negative at the same time, which the authors interpret as reflecting poignancy.

## why is the news so good?

socioemotional selectivity theory (Carstensen, Isaacowitz, & Charles, 1999):

- individuals constantly monitor time, and their time perspective has important motivational effects

- when time is perceived as expansive, individuals do things that will help them in the future, regardless of the ramifications of that for current affect

So there's lots of good news in the field of affect, emotion, and aging. And so the next question, of course, is why this news is so good? We're all certainly aware of the many psychological processes that are going in the opposite direction as people are getting older. Certainly physical health, cognitive functioning in the same age ranges that we're seeing pretty good affective profiles, we're seeing clear evidence, even the most sort of optimistic gerontologist will tell you that by the time people are in their 70s they will show reliable cognitive decrement across the full range of cognitive abilities on average. So why is the news from the affect literature so good? Socioemotional selectivity theory has been presented as one theoretical perspective that may help us understand why the literature on affect in aging is as it is. A sort of core proposition of socioemotional selectivity theory is that individuals, no matter what their age, are constantly paying attention to time. And, the way they feel about their time in a particular situation will have important motivational effects on them.

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- individuals constantly monitor time, and their time perspective has important motivational effects

- when time is perceived as expansive, individuals do things that will help them in the future, regardless of the ramifications of that for current affect

So the idea is that we're always paying attention to our time relationships in any situation and we're thinking about how much time we have left in the particular situation. I won't make any connections to the current conference, of course. The theory proposes that when people think about their time and relationship to their situation and see it as expansive and open-ended, they're going to do things, and this is quite logical, that's going to help them out later on. They're going to do things that will benefit them in the future and they're going to ignore how that's going to make them feel right now. Classic example of this, a college student who needs a recommendation letter from a professor will go to office hours even if the professor makes them feel really miserable, because they need that resource, so they have to sort of downplay their current affect in the service of pursuing things that will help them out in the future.

## when time is limited

individuals are motivated to pursue goals that  
will be affectively rewarding

feeling good is not something that is banked for  
the future, has its effects in the here and now –  
good strategy when future seems limited

so, emotions and emotion regulation are a  
motivated goal in situations when time is  
limited

In contrast, when people think about their time and see it as being limited, feel like they will be facing some sort of ending event soon, it doesn't make any sense to pursue goals that will benefit you in some uncertain future. When you perceive time as limited, individuals are instead motivated, according to the theory, to pursue goals that are going to be affectively rewarding, because feeling good happens in the here and now and not in some nebulous future. So rather than banking things for the future, people who perceive their time as limited will do things that are motivated to pursue goals that will make them feel good in the here and now. And so emotions and emotion regulation become a motivated goal according to the theory when time is limited.

## social aging

evidence that older individuals

1. have fewer, more emotionally meaningful social partners (selectivity: Lang et al., 1998)
  2. make social choices in accordance with a motivation to regulate emotions/ feel good:
    - who gets cut? Lang et al., 1998
    - who would you choose to spend time with? Fredrickson & Carstensen, 1990
- social choices based on feelings

This fits very nicely with some literature on social aging. As people get older, there's quite clear evidence that they have, they end up having fewer social partners, but that decline is really in the acquaintances. People seem to get rid of the people they're not so close to as they get older and maintain their core of very close social relationships. And there are a number of studies that have looked at people's social choices at different ages. So if you look at who gets cut out of the social network as people get older, Lang has looked at over several years, who gets eliminated from people's social networks, and the people who get eliminated among older adults are peripheral social partners, acquaintances, people who they're not close to emotionally. In a series of studies asking people, "Who do you want to spend time with if you have a surprise half hour of free time", older people tend to choose more emotionally close social partners. Young people just don't care very much, they could sort of go either way. Older people in their social network seem to be making choices about who stays and who goes, what's interesting and what's not based on feelings, who is going to make you feel good.

## it's not just about aging

other contexts in which individuals make social choices based on emotional goals:

Hong Kong studies (Fung et al., 1997)

HIV-positive men (Carstensen & Fredrickson, 1998)

Importantly, it's not just about aging. The theory posits that these motivational changes are a function of time perception, not about age per se. In fact there's good evidence that it is more general than just looking at age. Helene Fung did a very elegant series of studies looking at people's social choices in Hong Kong leading up to the turnover to China, which in the press in Hong Kong was represented as being this massive scary ending that no one knew what was going to happen. And what they found was that as the turnover got closer, young people started making social choices that looked like older people. Young people started to prefer close social partners. After the turnover, the age difference returned and young people again went back to not caring so much. Older people continued to prefer to interact with emotionally close partners.

In one study looking at men with different HIV status who were all on average the same age, they found a pretty clear relationship such that those who were HIV-positive and symptomatic very much preferred to spend that half hour of free time with a close social partner. Men who were HIV-positive asymptomatic, and the idea here is that they perceived their time as less limited than the HIV-positive symptomatic men, they were less concerned with the emotional closeness of the social partners. So some evidence that the emotion focus that's suggested by socio-emotional selective theory is common to situations in which time is limited and age is just one good example of that.

## it's not always adaptive

emotion-focus should be adaptive when time is indeed limited, but....

not good for young adults to make these sorts of social choices, because their time is not limited (Fung et al., 2001)

not good for individuals who have close relationships filled with negative affect --- bad marriages (Carstensen et al., 1996), Holocaust survivors (Isaacowitz, Smith, & Carstensen, 2003)

The theory argues that this makes perfect sense for older people to do, that it makes good sense for them to focus on things that will help them out now, ignore things that may or may not help them out later. But in fact it's not always adaptive to focus on close social partners and be so concerned with emotion. When time is indeed limited, the theory would argue that it's good to focus on close social partners. But there's some evidence that those subset of young adults who make social choices more common to older adults and seem to use emotion as a really important metric in those choices at the expense of the goals that may help them out in the future, like gaining information or interacting with people with whom they may end up having a rapport but don't yet, when young people are so emotion focused that seemed to not be good for them. It's off time for them, their time is not limited, so they don't need to be making social choices as though it is. And there's some evidence that if you're focused on emotion and on close relationships that's great unless those relationships are really terrible or filled with negative affect for other reasons. So if you have a bad marriage, and as you get older you become more and more focused on your closest social partner, aka your spouse, that's not going to somehow magically be good for you. That's still going to be a negative relationship. And I've found in some work looking at Holocaust survivors that individuals who focus their social relationships on other individuals who are experiencing high levels of negative affect themselves, again that's not good for their affective lives.

## but in general...

1. older individuals have surprisingly positive affective lives
2. older individuals make social choices based on emotions, and are motivated to pursue emotional goals
3. older people are happy because being happy is salient to them, and their motivational system is oriented toward that goal

But in general, we can sort of make three tentative conclusions. Older individuals certainly seem to have extant affective lives. There was a lot of expectation that older people would be shown to have sort of dampened, mellow affective lives, and that seems to not be the case. Older people on average seem to have surprisingly positive affective lives. They make social choices based on emotions and are motivated to pursue emotional goals. And what I think you can derive from this, and I'll try to convince you of it some more with the remainder of the time, is that older people are happy not just by accident. But instead, older people are happy because being happy and regulating their affective state is highly salient to them, and their motivational system is oriented towards accomplishing that goal, even at the expense of other possible goals.

## what are the cognitive mechanisms involved?

early work focused on memory  
(Carstensen & Turk-Charles, 1994):  
no age differences in overall recall of text  
but age differences in proportion of factual vs. emotional material recalled  
older adults recalled relatively more of the emotional content of the stories

So with a motivational account such as this, it's sort of an obvious question – well what are the cognitive mechanisms? How do these motivations actually reveal themselves in people's interaction with the world and their behavior? Early work trying to look at the cognitive mechanisms underlying socioemotional selective theory focused on memory. In one study, young and old adults were presented with a text from *The Shell Seekers* by Rosamunde Pilcher, if any of you read that one, it was a best seller. And older and younger subjects had an incidental memory test some time later to see what they recalled from the text. And interestingly, a lot of the things that I'll talk about today you could argue, well, that's just age decrement in sort of neural pathways or in cognitive processing. Here was a task in which there are no overall age differences in the amount of material recalled. So it's really nice, because you see in this particular memory task no age differences in overall recall. But there were important age differences in what people remembered. The young people remembered basically the facts of the text – what happened in the passage that they read. And the older people remembered how the characters felt, how they themselves reacted as readers. There seemed to be this difference, such that older people were remembering more of the emotional properties of the text, whereas younger people were remembering more of the factual properties.

## brief side note on cognitive aging and emotion

Marcia Johnson: affect-focus vs. factual-focus

Gould & Dixon (1993): how I spent my vacation; older couples more tuned in to emotion content, don't much care about the facts  
not so for younger couples

Brief side note here on some other research from cognitive aging that usually doesn't get mentioned in a talk on emotion, but is really quite relevant, Marcia Johnson has done a number of studies showing that for older people, their memory is oriented around this affective focus that you see in the Carstensen and Turk-Charles study I just mentioned. That older people's memory is oriented around remembering the affective pieces of things and that's actually bad for their factual memory. So some of the age declines you see in factual memory may be a function of differences between older and younger individuals in what material is focused on. And if you induce young people to have an affective focus when they read a text, their recall will be worse. My favorite study of this type, though, is one by Gould and Roger Dixon, where they simply asked older and younger married couples to talk about their most recent vacation. And the young couples, as they report, gave this extensive factual account of their vacation. We arrived on time at the destination. We took the Super Shuttle to our hotel and we unpacked. We went to dinner, and then we did this, by all accounts sort of a painfully factual account of the vacation. The older couples gave the highlights tour, as I like to call it. They said what they liked the best, the thing that they liked the worst, and that was about it. You could certainly make the case that that's because the older people don't remember the facts. But it's compelling in light of the other evidence that in cases where there were no overall age differences, that it wasn't the older people were trying and failing to remember the facts. What they thought you wanted to know was what they liked the most and what they didn't like, as though they were oriented towards the affective component of the experience.

## back to cognitive bases of socioemotional selectivity

### *memory*

older adults recall more emotional content of a  
text (Carstensen & Turk-Charles, 1994)

older adults show forgetfulness for negative  
emotional material (e.g., Charles et al., 2003)

older adults better remember emotional  
persuasive messages (Fung & Carstensen,  
2003)

So back to actual research on socio-emotional selectivity theory, more recently a number of studies have found indeed, there are differences in memory based on emotional components of stimuli when you look at age differences in memory. In one study using slides from the International Affective Picture System, older people seemed to show this unique forgetfulness for the negative, disgusting or saddening pictures. They didn't show any such forgetfulness for the positive or neutral pictures and the young people showed no differences in memory performance based on valence. The older people seemed to be screening out of their memory, the bad stuff. And in some research looking at persuasive messages, older people seem to better remember emotional persuasive messages, whereas the emotional aspects of the persuasion don't seem to be quite as memorable to younger people.

## what of attention?

### *more mixed results*

Mather et al. (2002): dot probe, older adults seem to orient away from negative faces

Charles et al. (2003): everyone looked more at negative, but older people forget them

Now I've been interested in the attentional mechanisms underlying socioemotional selectivity theory and there are a number of reasons that I've chosen to focus in particular on attention. One because I think that when we see differences that are as large in outcome as these are, it makes sense to look for reasons related to chaos theory. You can think about sort of computer modeling reasons for this. It makes sense that these processes diverge as close to input as possible. So anytime you see memory differences, you sort of want to know whether that's in fact the result of biases in attention. But really the reason to think about attention in the context of socioemotional selectivity theory is that the theory says that older and younger people are focused on different things. It makes an attentional claim, and so it's been interesting to me to try to look at attention more specifically. Some studies have looked at attention in emotional material in older people and have produced mixed results. In one study using dot probes, Mather and colleagues found that older people, when you presented them with a pair of neutral and negative faces that the dot probe came up behind, they seemed be slow in response to the negative faces, as though they were somehow ignoring, not paying attention to the negative faces. In that IAPS study I just mentioned, everybody, young and old, looked more at the negative, disturbing, saddening, disgusting slides; the older people just seemed to forget them.

## work in my lab: rationale

basic idea: attention may be where the “action”  
is for some individual and age differences in  
socioemotional functioning

do some individuals, or members of some age  
groups, show certain preferences or biases in  
their attention to emotional stimuli – and does  
that facilitate successful (or not) emotion  
regulation?

So the results from attentional research have been mixed and this is part of the reason for the particular nature of the work that I’ve done in my lab. I still believe that attention may be where the action is for age differences in socioemotional functioning as socioemotional selectivity theory would predict, as well as for some individual differences, which I’ll talk about.

## limitations of previous methods

*emotional Stroop*

*dot-probe*

have both been widely used in experimental psychopathology

difficult to differentiate attentional biases and response bias

need for on-line attentional measure that allows recording free from response biases

The basic question is do some individuals or members of some age groups show certain preferences or biases in their attention to emotional stimuli, and what role does this have in facilitating successful affective regulation or not? I don't really have time to go into the various methodologies well used in attention research, things like the Emotional Stroop and Dot Probe we've heard some about, widely used across many fields, and there are many strengths to those methodologies. But it is hard with those response-oriented tasks to know when you see differences between groups, is it really because of attention or is it something else? There are always response components, you have to press a button or make some response.

## better measure of visual attention?

*eye tracking: a way of measuring visual attention in nearly real time*

recent work in anxiety research: attention to ambiguous threat words

what about applying this to understanding attention to real-world visual stimuli?

could this help understand individual and age differences in well-being?

And so there was, other people have argued this more compellingly than I can, a need for more online attentional measure that allows for the recording of attention free from response biases, and eye tracking provides one way of doing this. Lots of recent research in anxiety research; they really have been at the forefront of using eye tracking study emotions. I tried in my lab to use eye tracking to understanding attention to real world emotional stimuli presented visually and asked the question, well could this help us understand individual and age differences in well being?

## Proceedings from the ETS & ARI Emotional Intelligence Workshop

### Session V: Applications



Just to give you a quick sense of the setup, the subject is seated in front of the computer. You've seen some eye trackers before during this conference, ours is under the screen shooting illumination at the subject's pupil. We actually have a magnet behind the subject and we require more extensive calibration than you've heard about, because it's a more accurate system. It allows for freer head movement. The magnet helps to compensate for head position. So the tracker records gaze position 60 times a second, the accuracy is better than one degree visual angle, so it works pretty well.

## study 1: optimism

presented optimistic and pessimistic college students with 3 types of stimuli (15s/each):

1. Images of skin cancer (melanoma), a negative/unpleasant image
2. Matched schematic line drawings showing the contours of the cancers without the coloration
3. Faces rated as neutral by external raters

instructions: view naturally, as if at home watching TV

The first study we did on this looked at optimism in college students and the reason for this was some sort of debate in the personality literature as to whether optimists do or do not ignore negative information. And so we presented subjects with various stimuli. Some of them were unpleasant, and these were pictures of skin cancer. We also had neutral matched schematic line drawings as well as faces that were rated as neutral. We simply asked subjects to look naturally, as if you were at home watching television.

## results

Optimists looked less at skin cancer images than pessimists -- Mean fixation to skin cancer:

Optimists: 36.86% of total time; Pessimists: 48.29%

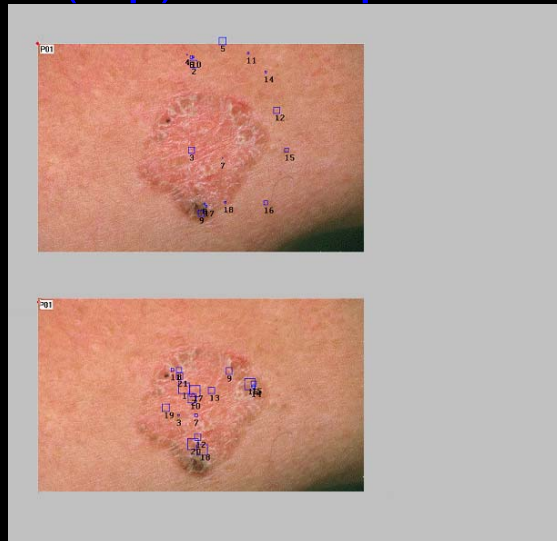
$F(1, 48) = 5.55, p < .05$

this relationship remained even in a conservative test, in which residualized scores were computed regressing fixation time for each skin cancer image on fixation time for its matched schematic line drawing. These residual scores were then summed across the 5 skin cancer – line drawing pairs. Thus, positive scores indicate that an individual attended more to skin cancer images than would be predicted based on his or her fixation to the matched line drawing, and negative scores indicate less fixation to skin cancer than line drawings would predict. The residual scores of optimists ( $M = -.16$ ) were significantly less than those of pessimists ( $M = .23$ ),  $F(1, 48) = 4.73, p < .05$ .

this remained significant after controlling for Neuroticism, Depressive Symptoms, and Positive and Negative Affect.

And the results which, you're not going to be able to read this, so I'll summarize it as well as the big paragraph where I try to convince people that it's actually an optimism effect. The optimists looked less at the skin cancer. There were no differences between optimists and pessimists in the other stimuli. You can control the hell out of these things using all other variables that we know are correlated with optimism, like affect and depression. It still was the case, and even using a more conservative test where you control for attention to the same drawing, it's just without the cancer, just with the lines.

## an example of an optimist (top) and a pessimist (bottom)



Numbers signify order of fixation (1 = first fixation), and box size is an index of fixation length, with larger boxes indicating a longer fixation at that location. Percent fixation within the AOI was 37.57% for the participant in the top panel, and 85.58% for the bottom panel.

Just to give you an example of what this looked like, here's a skin cancer picture, an optimistic subject on top, pessimistic on the bottom. Numbers are order in terms of where they were looking at; one is first. Bigger boxes mean the person was there for longer. The optimist on top, you can see is sort of dancing around the skin cancer. Fifteen seconds is actually a long time, in more recent stuff we present things faster. The pessimist spends almost pretty much the entire time looking within the actual bounds of the skin cancer on the bottom.

## study 2

new study: increase relevance for some, add  
memory task, anxiety measure

results: no effect of relevance manipulation

optimists still looked less at cancer images,  
even controlling for anxiety

no differences between optimists and  
pessimists in recognition memory task for  
cancer or faces

People said, “Well, you know, knowing this was not relevant for your college student sample.” That could be the case. We added some more measures and we found that we couldn’t manipulate the effect away just by trying to make the task more relevant to some subjects. Optimists still looked less at the cancer images, even controlling for anxiety. Interestingly, there were no memory differences between optimists and pessimists.

## what about in older adults?

difficulties with tracking: droopy eyelids,  
yellowing lenses, bi/trifocals

but, in first study, was able to successfully  
track 21 of 31 older adults, or 68% (as  
compared to 89% in younger adults)

presented same set of stimuli (plus added  
tests of visual acuity and contrast  
sensitivity)

The question of course is what about in older people? There's lots about visual aging that conspires against this being a successful line of research. As people get older their eyelids get droopy. Their lenses yellow, and you have bi- and sometimes trifocals that are not very eye tracker friendly. Nonetheless, in our first study we were able to successfully track 21 of our 31 subjects; that's a lot worse than we do with younger people, but not bad, presented the same set of stimuli and then added some vision measures to make sure these weren't the effects of age changes in vision or contrast sensitivity, and we got something very interesting with our older people.

## results with older adults

fixation patterns identical but interaction  
with optimism – older optimists look  
MORE at the cancer images  
(in contrast to young, where optimists  
looked LESS at the cancer images)

In the college students, remember the optimistic looked less at the skin cancer. We actually found no overall fixation differences between the young and older individuals, so they looked the same amount overall at stuff. The difference we found was in the relationship between optimism and attention. Whereas our young adult subjects, the optimists looked less at the skin cancer than the pessimists, in our older subjects the optimists looked more at the skin cancer than did the pessimists.

older pessimist (left) and  
optimist (right)



Just to give you an illustration of this with a different cancer image, the person on the left is a pessimist, and he is sort of dancing around, looking at the glove that the person in the picture is wearing and never getting to the heart of the matter there, whereas what you see on the right is the more optimistic older individual who spends much more time looking head on at the actual skin cancer picture.

## why should there be an age difference?

### *2 plausible mechanisms*

1. relevance
2. experience
  - habitation
  - expertise
  - mere exposure

Why should this age difference exist? There are I think two plausible mechanisms. One, is that skin cancer is more relevant to older people and the relevance manipulation with college students was not strong enough. What I think is more interesting and more relevant to this conference is the idea that somehow experience changes these relationships. And particularly what I think is the most interesting possibility, is that there is some sort of expertise relationship. Well known in human factors literature, expert drivers have different patterns of attention than novice drivers, and with pilots; it's been shown with a lot of people in a lot of different professions. What does experience dealing with emotions in one way or another, does that lead people to become experts in their particular way of attending to emotional information? What impact does that have, the accumulation of those patterns over time? And that's something that I'm planning, in the process of getting some studies underway to try to manipulate in the lab, sort of do a model of how these age processes may unfold by giving subjects different sorts of experience, different levels of expertise with emotional stimuli and see how that affects their attention.

## new study underway

more directly evaluating age differences  
in attention to emotional and  
nonemotional stimuli

stimuli: synthetic faces, created neutral or  
prototype emotion faces:



We changed our stimuli somewhat. We're now doing one study to try to more directly test socioemotional selectivity theory with use these synthetic faces, controls for a lot of these psychophysical problems you get with these sorts of stimuli. So these are really nice because they're all of equal luminance and all the other perceptual variables you need to worry about, and we're looking at right now, relative attention in young and old individuals to emotional versus non-emotional faces when at least most, if not all, of the other perceptual differences between the stimuli have been controlled.

## contextualizing attention

in addition to the usual vision tests and  
recognition memory for target stimuli...

general attention and inhibition  
(red/green)

processing speed (Digit Symbol)

working memory (Digit Span)

crystallized intelligence (Vocabulary)

We're also looking to try to contextualize attention. You get these attentional differences. Well how does it relate to other information processing domains? And in particular in the context of aging one needs to have lots of measures of cognitive aging so you can control for it and say look, it's not just the effects of changes in working memory spans or things like that.

## future directions

where attentional preferences and biases  
come from – quasi-experimental and  
experimental work to test origins

where attentional preferences and biases  
go to: role in health-related behavior

And for myself, what I am most interested in is first of all, looking at where attentional preferences and biases come from, and as I mentioned using quasi-experimental and experimental lab-based work to test the origins of attentional biases, but then to look at where attentional preferences and biases go, what role do they play in health-relevant memory and behavior. So, I'm getting together a series of studies looking at does how much you look at skin cancer actually predict at all how likely you are to wear the appropriate sunscreen when you go out in the sun?

## the \$64,000 question

*does emotional intelligence increase with age?*

affect, cognition and control data suggest better in older individuals, but...

is it a cohort difference, with current older cohorts being better emotion regulators than younger ones?

evidence from cohort increases in depression suggests this – younger cohorts have higher LIFETIME risk of depression already

implications: throw hands in the air? try to learn what older cohorts have/do?

So back on target for this conference, the \$64,000 question is well what about emotional intelligence and age? Does emotional intelligence increase, for instance, with age one can hypothesize? The affect, cognition and control data I would argue suggest that emotional intelligence may in fact be better in older individuals. But of course we have a big cohort problem here. Maybe it's just a cohort difference, such that the current older cohorts are better emotion regulators than younger ones. A lot of Glen Elder's work speaks to this; maybe the experience of surviving the Depression has led to better sorts of self-regulation strategies in the current cohort of older individuals. The depression data, for example, suggests strong cohort affects. We know that with each successive cohort, for instance World War II, the rates of lifetime prevalence of depression goes up, even though older people are older and had more chance to be depressed. So there's a clear cohort difference going on, at least in terms of diagnosable major depression. And so we sort of are tempted to throw our hands in the air and basically try to learn from current cohorts of old people – what are you doing? – as a way of discerning lessons for emotional intelligence. So certainly I would say there's good reason to think part of this is indeed cohort related.

or, a developmental  
interpretation

socioemotional selectivity theory suggests  
that normative developmental  
processes should lead to more emotion  
“work” and probably also more  
emotional “intelligence”

But I think that a developmental interpretation is still possible and quite plausible to account for some of these processes. Certainly socioemotional selectivity theory would suggest that normative developmental processes should lead older people to work more on their emotions, and maybe the degree to which older people are working more on their emotions leads them to be more emotionally intelligent.

## but, some caveats

the emotion-focus seems only to work when it is  
appropriate to the context (future actually is  
limited)

off-time emotion-focus may actually lead to  
less happiness (Fung et al., 1997)  
worse memory (Marcia Johnson)

and there are risks of being a full-time emotion  
“worker” (Isaacowitz et al., 2003)

But there are certainly some caveats even to that optimistic view that there may be something developmental going here. Emotion focus, as I argued, is only good when it's done at the right time and is appropriate for the context that the person is in. Off-time emotion focus, being focused on emotions and being really an emotion worker in terms of motivation, goals, and cognition may be bad for you, may lead to less happiness, worse memory and generally even worse affective state, if it's not the right thing for you to be doing that, if there are other demands, long-term goals that need to be pursued for instance. So it's not necessarily always good to be motivated to be an emotion worker.

nonetheless...

life-span perspectives are critical to  
thinking about emotional intelligence  
aging may turn out to be the best  
education for emotional intelligence  
luckily, it is free and everyone has access  
to it!

Nonetheless, I would argue, both because it's interesting and as people have alluded to today, there are demographic changes that make us want to think more and more about this as the population here in America is tilted more towards older individuals. I would argue most generally that lifespan perspectives are critical to thinking about this. The demographic need is there. But also I think it's just interesting in light of theory and research in the study of emotion aging, how it relates. Aging may be the best education that's out there for emotional intelligence, given the data that I've presented today, and luckily it's free and everyone has access to it. Thank you very much for your attention.

## DISCUSSION

### DISCUSSION

**DR. GRANDEY:** I was thinking about that really interesting finding about the older optimists and the older pessimists and I wondered if you had done anything looking at their self-talk. We know that optimism is related to more effective coping, so I was thinking maybe they're doing a reappraisal, either a detachment, or that they're thinking, ooh, it's not me, whereas the pessimist would be like, oh, that could be me. I don't want to look.

**DR. ISAACOWITZ:** And certainly the classic interpretation of optimism is that everybody sees the world the same way and optimists reframe in a positive way and pessimists reframe in a negative way. And I believe, and I don't really have time to make the case that strongly, but that would be a really sort of silly way to design a system. It would be a very expensive way. If every time you experience something, you have to sort of take it in and then spin it. And I think the differences you see, and we see this with much shorter time frames than 15 seconds, they emerge, I mean I wouldn't use the term automatic, because that's a weighted term and I wouldn't mean it, but they're very, very fast, and you'd have to have some amazingly quick reappraisal going on to use that particular account.

## DISCUSSION

**DR. ISAACOWITZ (CONT'D):** I think that experience dealing with these things a certain way, that maybe sort of volitional conscious deciding not to look at things reappraisal over time may have the effect of sort of up-regulating the system and may promote these attentional biases that don't involve any framing or reframing. I mean you think about sort of how many possible things we could be attending to at any possible second, we're only going to attend to some of them. And so my belief is the differences between optimists and pessimists is visible much earlier in the processing of information than interpretation, appraisal, reappraisal, but that's just my personal belief on that.

**DR. KATHERINE WHITE:** I have lots of questions, but I'll just ask one. The affect stuff that you showed early on, it kind of goes counterintuitive to what we think of when we think of our stereotypes of the grumpy old man and those kinds of things. I wonder about your samples that they study and whether they've controlled for things like educational differences, health differences, socio-economic status and that.

## DISCUSSION

**DR. ISAACOWITZ:** Yeah. In the MacArthur data and in the Berlin Aging Study data, everything was thrown into that equation, because of course you worry about those sorts of differences. And these things emerge even when you control for socio-economic status, health, etcetera. And it's consistent with what's emerging even in the cognitive literature that, you know the 60s and early 70s are actually quite a good time across a number of domains. It's in the later 70s and 80s where multiple problems start to happen on average, physical health, comorbidity of diseases, more reliable cognitive decline, and then sort of the news being not quite as good in affect. It reminds me though, there was someone who I knew from my undergraduate days who always argued that this is impossible. Older people have huge rates of depression. Of course it turned out that she spent all her time working at a geriatric depression clinic, so it depends on your sample to some degree and using the best methodologies that have been out there. But epidemiological and smaller scale studies all seem to point in this direction.

**DR. GADE:** I've actually got a couple of questions, one a general one and one a more technical one. Let me do the technical one first. You mention that you measured and controlled for contrast sensitivity. How did you do that?

## DISCUSSION

**DR. ISAACOWITZ:** A number of different ways. The sort of rudimentary way was that we had had those match drawings that had all the contours of the cancer without the color. And then we got more serious about it, brought in a vision gradient researcher and did a whole psychophysical rating thing to see if there were attentional differences ones that were rated using these psychophysical measurements as high and low contrast – no difference. It didn't affect the findings. There's a contrast sensitivity measure that we used, the Pelli Robson on all of our subjects, and the older people, not surprisingly, have worse contrast sensitivity, but controlling for those differences doesn't change the actual age effect.

**DR. GADE:** The other question was what about gender differences? We've seen in other things that there were a lot of gender differences, but you didn't mention any.

**DR. ISAACOWITZ:** Yeah, and it's been harder to find. This is a big problem in the aging literature. On the one hand, the vast majority of old people are women. So anytime you have a convenient sample of older individuals, you're going to get predominantly women.

## DISCUSSION

**DR. ISAACOWITZ (CONT'D):** So what happens is, in the really big samples, like the Berlin Aging Study data, they have equal numbers of men and women in each age group. But of course comparing a 75-year-old man to a 75-year-old woman is not particularly appropriate, because of the differential survival. I mean we know that 75-year-old man is more unique than a 75-year-old woman, and so it's not really a fair comparison to look at the data that way. So, the stuff that's out there in the aging literature has not found age differences in these processes, but the sampling problems are enormous, so that may be a part of it.

**PARTICIPANT:** You were talking about cohort differences and how that made your data less reliable. Could you achieve more accurate findings if you went into say other countries or other cultures and did a whole slew of research in different places?

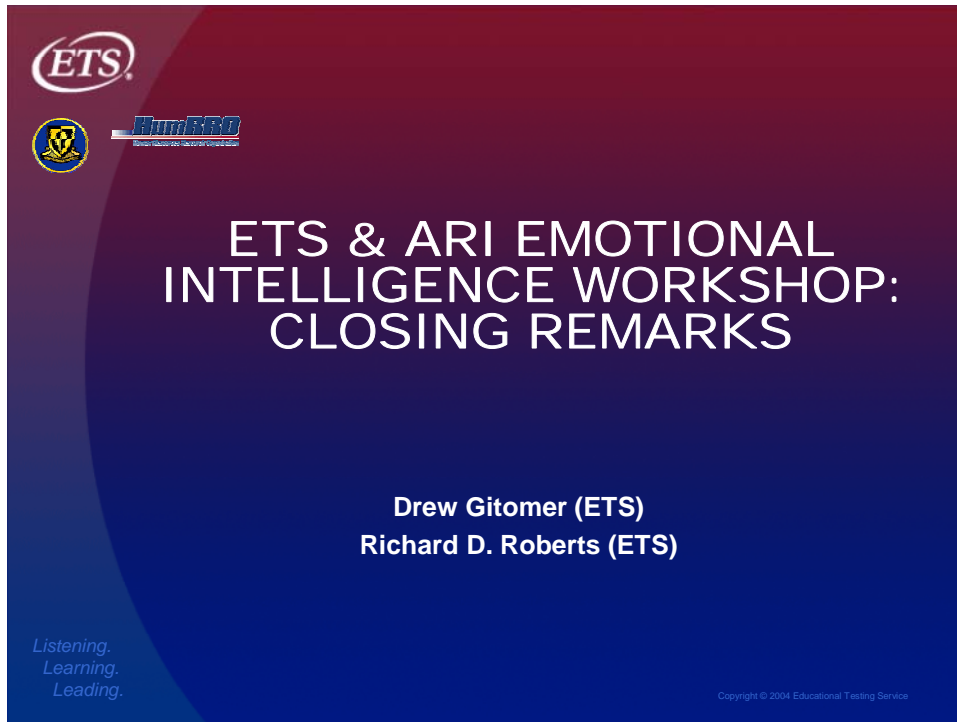
**DR. ISAACOWITZ:** Yeah, absolutely. I'm just on the verge of collaborating with someone in Hong Kong and we are going to actually use the same eye tracking stuff and to try to replicate those findings in that culture. But the field of sort of cross-cultural gerontology has been slow to develop. But what has emerged from it is more similarity than differences in these processes. And socioemotional selectivity theory has only been studied in a couple of cultures and has been pretty consistent, but that work is still in its infancy. But certainly that would strengthen the case if we could find it cross-culturally.

## DISCUSSION

**DR. LEN WHITE:** What does the literature show regarding aging and emotion recognition in studies of facial recognition?

**DR. ISAACOWITZ:** There's very little on that. Carol Magai at Long Island University has done some of this work. And so if memory serves correctly, I think it turns out to be a little bit harder to identify emotions in older people's faces. But in terms of recognition accuracy, I don't think that there are big age effects. But as far as I know there's only been one study that she's done looking at that. So, there are sort of facial changes that obscure wrinkles, obscure some of the usual ways that we would have of detecting emotion on a face, so sort of reading emotion in people's faces getting harder as people older makes sense. Certainly selectivity theory would suggest that older people should be better at reading emotions, but it's also the context they're in. I mean they may be better reading other old people's emotions, which may have some differences. So it certainly would be a very interesting line of research, but it hasn't been much pursued.

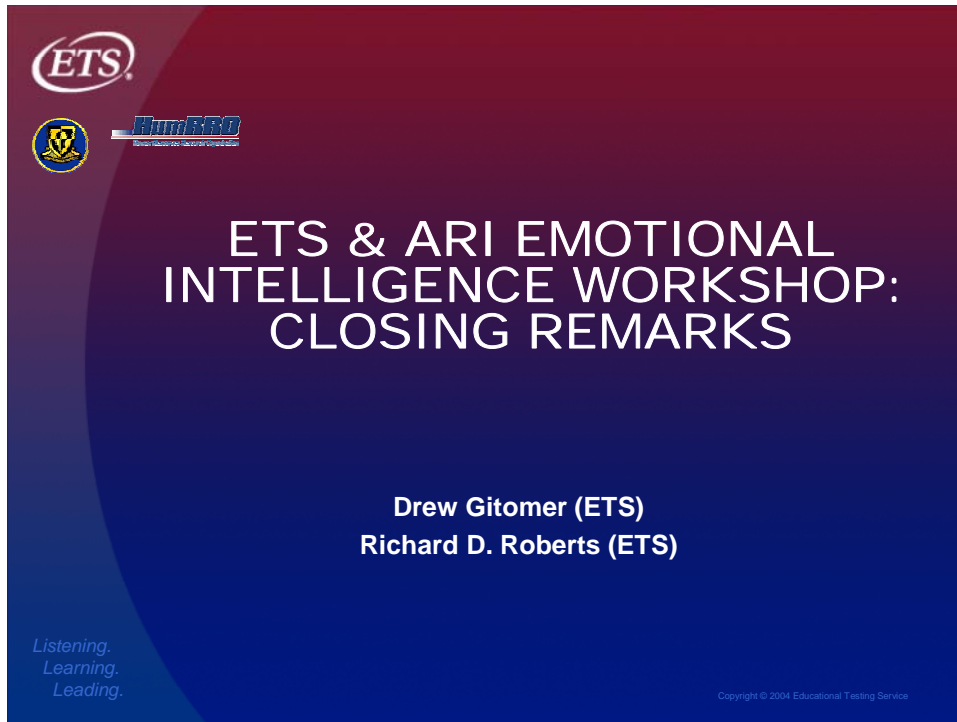
**CLOSING REMARKS**



## CLOSING REMARKS

**DR. MATTHEWS:** Thank you. Before we move on to our closing sequence and I hand over to Rich for orchestrating the final event, I'd like to express on behalf of the organizers our extreme gratitude towards Rich. He's really worked extremely hard to make this workshop the success it's been. Thank you, Rich.

**DR. ROBERTS:** Well, I guess we're all tired. Who's tired (noise indicating near universal agreement)? I am actually not going to sum up. I know a lot of people have wanted contact details, and I'm going to assure you that that will be the case. Actually, I will sum up, very briefly. I see emotional intelligence as a soup stone. And what you've experienced here today, or over the past three days, is lots of different ideas about emotions. And if you take that soup stone analogy and think about it, I think that makes this a very interesting field to be thinking about future directions, particularly on the applied front. That's it, pure and simple; we'll be writing on the analogy in future papers no doubt, if some are you are befuddled. Thanks to all the speakers, let's give them a round of applause. Now all the speakers, I want you to thank all the participants. And now I'm going to actually hand over to Dr. Drew Gitomer who's going to provide some closing remarks.



**DR. GITOMER:** Thank you. I'm going to be very brief here also, because as Derek's talk pointed out, and I think also about a recent talk here by Tim Salthouse, in terms of the declines that we experience as we age, that started at about 20, so the younger folks here, don't get too smug. You just have further to fall. I guess I feel really good about the conference, but don't really remember what anybody said. No, actually, unfortunately I did miss the first two days, because I was drawn off to Washington for a different meeting, but I'm very much looking forward to the proceedings that will evolve. The talks this morning were outstanding; the feedback I've gotten from everybody has just been tremendous. So I just want to extend my thanks to everybody – the organizing committee, ARI and HUMRRO, Paul and Patrick and Bill, Gerry and Moshe for organizing this, Rich especially for just pulling this together in record time. Thank you all so much. And I want to give a very special thanks to all the folks who made this happen behind the scenes: Susan Martin, Pippa Markham, Kathy Howell, and Jen Minsky. I think that's the core team. The folks on the AV who've been filming all of this, making this happen and our colleagues from the conference center, all these folks together, you know this stuff doesn't just happen. They've just worked very hard and thank you all so much. Thank you to all the presenters. I know the committee is thinking about ways of disseminating this, and I think that this is the beginning of a very long conversation. So thank you all and safe trips home.

## **APPENDIX**



# EMOTIONAL INTELLIGENCE: KNOWN & UNKNOWN

13-15 NOVEMBER, 2003

## *SPONSORS*

Educational Testing Service (ETS),  
U. S. Army Research Institute (ARI), &  
Human Resources Research Organization (HumRRO).



## *VENUE*

Chauncey Conference Center, Princeton, New Jersey, U.S.A.

## *ORGANIZERS*

Richard D. Roberts, ETS (Chair)  
Paul A. Gade, U.S. Army Research Institute  
Patrick C. Kyllonen, ETS  
Moshe Zeidner, University of Haifa, Israel  
Gerald Mathews, University of Cincinnati

William Strickland, Human Resources Research Organization



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## OPENING REMARKS

**Preface:** A cordial welcome is extended from all of the organizing committee to you as a contributor and/or participant during this workshop. We trust that you find it an engaging experience.

As always, there are many entities that make such an event possible. Chief among them are the following organizations, which have variously provided institutional, logistical, and financial support: Educational Testing Service, Army Research Institute, and the Human Resources Research Organization.

Many individuals have given much of their time too, certainly well beyond the call of duty. Special thanks to Sue Martin, Kathy Howell, Pippa Markham, and Venus Mifsud from the Center for New Constructs, ETS. Each of you, in your own way, has been instrumental in making this possible. Thanks also to Drew Gitomer (Senior VP, ETS) and Paul Gade (Chief Psychologist, ARI) for agreeing to open and close the workshop.

This program contains many features, including the times for each session, presentation abstracts, and details of the speakers who will be contributing. There is also a ‘survival package’, which you may find useful for making your stay profitable, especially during ‘downtime’ from the conference.

Finally, although we do not anticipate it, throughout the duration of the workshop, if you have any difficulties, please have a word with Richard Roberts, Sue Martin, Pippa Markham, or Kathy Howell (preferably, in that order). Their aim is to make this as a rewarding experience as possible across the social-emotional-cognitive continuum!

**Conference Committee:** The conference organizers comprise the following: Richard D. Roberts (ETS, Princeton, NJ), Paul A. Gade (ARI, Alexandria, VA), Patrick C. Kyllonen (ETS, Princeton, NJ), William J. Strickland (HumRRO, Washington, DC), Gerald Matthews (University of Cincinnati, OH), and Moshe Zeidner (University of Haifa, Israel).

**The Purpose:** The purpose of this conference is to bring together 25 of the top researchers from around the world who have conducted research from a variety of perspectives with the aim of providing a scientific definition and taxonomic model of emotional intelligence. Furthermore, the conference aims to explore assessment and applications of the construct of emotional intelligence. The workshop will consist of five sessions, organized around the following themes:

## OPENING REMARKS

1. Emotions: Multi-Disciplinary Perspectives
2. Emotions: Psychological Perspectives
3. Related Constructs
4. Assessment
5. Applications

**Professor Paul Ekman**, will also deliver a keynote address, first thing Friday morning.

### About the Workshop

We see several justifications for holding this workshop. First, there is an *opportunity*. Over the last 20 years or so, considerable progress has been made in understanding traditional forms of human intelligence, how it may be assessed, its role in applied domains, and whether or not it can be enhanced. However, little attention has been paid to providing a rigorous scientific account of emotional intelligence (EI), the theme of this workshop. Perhaps because of this deficiency, there are a number of competing models of EI, none of which appears as full-blown as do current accounts of traditional forms of intelligence. This workshop provides a medium of exchange between experts from disparate fields in order to ascertain whether such a model is possible and if so, what the main components of emotional intelligence might look like inside a scientific framework.

Besides opportunity, there is a *need*. Claims that EI is a meaningful predictor of job performance, leadership capability, stress-coping, life satisfaction, and the like are standard in the popular literature, yet balanced, critical accounts and empirical data are scant. Although there have been a plethora of symposia on EI, and indeed, the odd conference where this is the general theme, the fact remains that these forums are often predisposed to accepting the existence and positive utility of the concept in advance. This workshop, in extending on previous research by the co-organizers, represents arguably the first even-handed attempt by a group of scientists to critically evaluate the state-of-the-art in theory, research, assessment, and applications. In doing so, an expected outcome of the workshop is to establish a scientific model of emotional intelligence that would inform further theory and measurement and to identify important applications.

### General Issues and Themes

The contributions of workshop participants reflect a variety of perspectives on emotions, emotional intelligence, and related constructs. We envisage that the following are some key issues that may be resolved:

- What is EI: a competence, a skill, or a learned outcome? How does EI relate to conventional intelligence?
- Is EI a cognitive or non-cognitive construct? How is EI related to management of specific emotions?

## OPENING REMARKS

- Does EI represent a general ability operating in all or most social contexts? Are there multiple dimensions of EI relevant to different emotional challenges and contexts? How could a multi-stratum psychometric model integrate multiple dimensions with existing personality and ability constructs?
- What are the cognitive underpinnings of EI? Is it explicit or implicit knowledge? Do artificial forms of intelligence need to include an emotional component?
- What is the optimal approach to assessment of EI? What are the strengths and weaknesses of different methodologies (e.g., self-reports)?
- What are the principal applied domains for EI? How can the emerging science of EI guide programs for schools and workplaces? Is it possible for EI to inform issues in gerontology and human factors? How do we separate applied science from the role of EI as a Zeitgeist?

## WORKSHOP SCHEDULE

Thursday, November 13

### Introductions

- 8:30 – 8:45 Drew H. Gitomer (Senior Vice President R&D, ETS)  
8:45 – 9:00 Paul A. Gade (ARI, U.S. Army Research Institute)

### Session I: Emotions: Multi-Disciplinary Perspectives

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**Chair: Moshe Zeidner (University of Haifa, Israel)**

- 09:00 – 09:40 Aaron Ben Ze'ev (University of Haifa, Israel) "Emotional Intelligence Online"  
09:40 – 09:50 Open Discussion  
09:50 – 10:30 Kathryn Lively (Dartmouth College) "Survey Approaches to the Sociology of Emotion: Old Questions and New Answers"  
10:30 – 10:40 Open Discussion  
10:40 – 11:00 Break  
11:00 – 11:40 Karl Heider (University of South Carolina) "An Anthropological View of Emotional Intelligences"  
11:40 – 11:50 Open Discussion  
11:50 – 12:30 Rosalind Picard (MIT Media Laboratory) "Affective Computing: Machines with Emotional Intelligence"  
12:30 – 12:40 Open Discussion  
12:40 – 14:00 Lunch @ Chauncey Conference Center – Solomon Room

### Session II: Emotions: Psychological Perspectives

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**Chair: William Strickland (HumRRO, Washington, DC)**

- 14:00 – 14:40 Lisa Feldman Barrett (Boston College) "Applying the Structure of Affect to Questions of Emotional Intelligence"  
14:40 – 14:50 Open Discussion  
14:50 – 15:30 Klaus Scherer (University of Geneva, Switzerland) "Cognitive Models of Emotion: Synthesis and Implications for Emotional Competence"  
15:30 – 15:40 Open Discussion  
15:40 – 16:00 Break  
16:00 – 16:40 Alicia Grandey (Penn State University) "Emotional Labor: A Psychological Perspective of Managing Emotions for a Wage"  
16:40 – 16:50 Open Discussion  
16:50 – 17:30 William Revelle (Northwestern University) "Emotions are to Personality as Weather is to Climate: Analogical Reasoning as a Tool for Scientific Investigation"  
17:30 – 17:40 Open Discussion  
17:40 – 18:00 Summary

### All Participants' Dinner

- 18:15 Buses depart for Princeton University  
18:30 – 21:30 Dinner @ Prospect House

## WORKSHOP SCHEDULE

### Friday, November 14

#### Keynote Address

08:00 – 09:00 Paul Ekman (University of California at San Francisco) “Emotional Skills”

09:00 – 09:20 Open Discussion

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#### Session III: Related Constructs

##### Chair: Patrick Kyllonen (ETS)

09:20 – 10:00 Lawrence James (University of Tennessee) “Conditional Reasoning: A New Approach to Personality Assessment”

10:00 – 10:10 Open Discussion

10:10 – 10:50 Gerard Saucier (University of Oregon) “What Is Beyond the Big Five? -- Isms and Other Personality Constructs”

10:50 – 11:00 Open Discussion

11:00 – 11:20 Break

11:20 – 12:00 Maureen O’Sullivan (University of San Francisco) “Social/Emotional Intelligence: From Factors to Functions”

12:00 – 12:10 Open Discussion

12:10 – 12:50 W. Lewis Johnson (University of Southern California) “Social Intelligence: Attentiveness and Politeness in Learner-Computer Interaction”

12:50 – 13:00 Open Discussion

13:00 – 14:00 Lunch @ Chauncey Conference Center

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#### Session IV: Assessment

##### Chair: Richard D. Roberts (ETS)

14:00 – 14:40 Fabio Sala (HayGroup) “Self- and Peer-Report Assessments of Emotional Intelligence”

14:40 – 14:50 Open Discussion

14:50 – 15:30 John (Jack) D. Mayer (University of New Hampshire) “Performance-Based Emotional Intelligence”

15:30 – 15:40 Open Discussion

15:40 – 16:00 Break

16:00 – 16:40 Peter Legree (ARI) “Consensus-Based Measurement”

16:40 – 16:50 Open Discussion

16:50 – 17:30 Richard Lane (University of Arizona) “Performance and Biological Mapping of Emotional Awareness”

17:30 – 17:40 Open Discussion

17:40 – 18:00 Summary

#### All Participants’ Dinner

18:00 – 21:00 Chauncey Conference Center – Solomon Room

## WORKSHOP SCHEDULE

**Saturday, November 15**

### **Session V: Applications**

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**Chair: Gerry Matthews (University of Cincinnati)**

- 08:00 – 08:40 Reuven Bar-On (University of Texas Medical Branch) “The Impact of Emotionally and Socially Intelligent Behavior on Performance”
- 08:40 – 08:50 Open Discussion
- 08:50 – 09:30 Joseph Zins (University of Cincinnati) “Building Success in School and Life Through Social and Emotional Learning”
- 09:30 – 09:40 Open Discussion
- 09:40 – 10:20 Ruth Kanfer (Georgia Institute of Technology) “Emotions in the Workplace”
- 10:20 – 10:30 Open Discussion
- 10:30 – 10:50 Break
- 10:50 – 11:30 Nancy Cooke (Arizona State University East) “Playing Well With Others: Emotional Intelligence Meets Team Performance”
- 11:30 – 11:40 Open Discussion
- 11:40 – 12:20 Derek Isaacowitz (Brandeis University) “Emotion and Aging: An Information Processing Perspective”
- 12:20 – 12:30 Open Discussion
- 12:30 – 12:50 Summary
- 12:50 – 13:00 Closing Remarks – Drew H. Gitomer (Senior Vice President R&D, ETS)

**Closing Luncheon in Solomon Dining Room 13:00 – 14:30**

### **Poster Session (November 13-15)**

Posters will be presented in the Sundial Room at Chauncey Conference Center for the duration of the conference. Pippa Markham (ETS) is the point of contact for all aspects associated with this part of the workshop.

## SESSION ABSTRACTS

### **Session I: Emotions: Multi-Disciplinary Perspectives**

**Chair: Moshe Zeidner (University of Haifa, Israel)**

Papers presented in this session concern internationally recognized experts in fields other than psychology who have recently turned attention to the study of emotions. These perspectives, spanning sociology, anthropology, philosophy, and computer science, may well inform research investigating emotional intelligence hitherto ignored by experts from psychology.

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#### **Emotional Intelligence Online**

**Aaron Ben Ze'ev (University of Haifa, Israel)**

At the basis of the notion of "emotional intelligence" are two adequate assumptions: (a) emotional reasoning is not identical with intellectual reasoning, and (b) the integration of the two types of reasoning is beneficial. Emotional intelligence expresses an optimal level of such integration. Such integration is difficult to obtain, as each type of reasoning is concerned with different types of realities and concerns. A high level of integration is achieved in online romantic relationships. The communication in such relationships is that of written text, which obviously depends much upon intellectual capacities. However, the role of imagination is significant in these relationships and hence emotions can be intense since there are very few practical limitations to the performance of virtual activities.

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#### **Survey Approaches to the Sociology of Emotion: Old Questions and New Answers**

**Kathryn Lively (Dartmouth College)**

Under what conditions do individuals experience emotion and what do they do with that emotion once it occurs? Do individuals with different socio-demographic characteristics vary in terms of their emotional self-reports, either in terms of frequency, intensity, duration, or appropriateness? To what degree are actors constrained by the domain in which their emotions are activated and to what extent are they bound by the hierarchical position that they occupy or their status as a function of their race, class, and, especially, their gender? Is there a structure of felt emotion that corresponds to the meaning structure of emotion words and, if so, how might this structure relate to one's emotional station, as well as to processes of emotion management more broadly? These questions, among others, are central to the sociological study of emotion and are, fundamentally, tied to our current understanding of emotional intelligence. These questions, among others, serve as the basis for this talk as I present findings from three sociological studies of emotion that are in various stages of publication. Unlike most studies of emotion that are based on ethnography, in-depth interviews, or small group interactions among college students, these studies are based on the General Social Survey, the only nationally representative

## SESSION ABSTRACTS

survey data that considers emotion. Although survey data bring with them their own unique set of limitations and concerns for those interested in the study of emotion, they do allow for compelling tests to the generalizability of existing work on emotion and serve to elaborate the very theories on which much of the research in this field is based.

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### **An Anthropological View of Emotional Intelligences** **Karl G. Heider (University of South Carolina)**

First two methodological points: culture is not society, and if we want to explore the cultural influences on emotion we need to look at those with similar cultures, not those with the same passports. And, there are interesting implications if we approach emotions as single words, or as clusters of words, or through processual sequences. Then I shall discuss some ideas about emotional intelligences held by some Minangkabau of West Sumatra, Indonesia.

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### **Affective Computing: Machines with Emotional Intelligence** **Rosalind Picard (MIT Media Laboratory)**

Over 70 studies on human-machine interaction in the last decade have pointed to an intriguing phenomenon: People interact with machines in a way that is basically social-emotional, even when the interaction is not designed to be that way. This finding holds true even for computer science students who know that machines don't have feelings. The finding suggests that many of the more subtle skills critical for human-human interaction are also significant for human-computer interaction. These include skills of emotional intelligence.

In this talk, I'll describe how we're giving computers emotional intelligence capabilities, specifically the ability to recognize and respond appropriately to human emotion. I'll show examples of systems that try to assess interest, frustration, stress, and a range of other states that occur when interacting with computers. These systems involve new kinds of sensing for desktop, wearable, and other environmental interfaces, as well as the development of new pattern recognition and machine learning algorithms for making inferences about emotion. I will also briefly describe some ways that computers currently can respond to emotion, such as with expressions of empathy, mirroring, and apology.

Current applications include human learning, usability feedback, health behavior change, and human-robot interaction.

## SESSION ABSTRACTS

### **Session II: Emotions: Psychological Perspectives** **Chair: William J. Strickland (HumRRO, Washington, DC)**

This session will review approaches to theory and measurement in the psychological literature on human emotions. Curiously, these approaches have remained relatively neglected in contemporary accounts of emotional intelligence, such that it would appear necessary to establish a rapprochement. Leading experts in this field will present empirical data, concepts, and theories.

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#### **Applying the Structure of Affect to Questions of Emotional Intelligence** **Lisa Feldman Barrett (Boston College)**

Do everyday folk notions of how to classify emotions (in terms such as anger, fear, and sadness) constitute the best model upon which to base questions about emotional intelligence? A brief review of research indicates that the evidence for this model surprisingly weak. Instead, consistent evidence is found for something that has been termed "the structure of affect." The components of this perspective are outlined, and the implications for emotional intelligence discussed.

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#### **Cognitive Models of Emotion: Synthesis and Implications for Emotional Competence** **Klaus Scherer (University of Geneva, Switzerland)**

The major purpose of the talk is to present, and justify, the claim that cognitive theories of emotion, in particular component theories based on appraisal notions, are particularly well suited to provide an appropriate theoretical structure for individual difference constructs such as trait emotionality or emotional competence. It is further argued that a solid theoretical basis with respect to emotion elicitation, differentiation, and regulation is a necessary condition for the sustainable development of valid methods to measure and evaluate these individual differences. Following a brief historical overview of cognitive theories of emotion elicitation and differentiation as well as a synthesis of the current state of appraisal theories, the author's own component process model is used as a paradigm to identify six major emotion processes contributing to emotion elicitation, differentiation, and regulation: Significance detection, implication evaluation, response preparation, multimodal integration, episodic memory storage, and procedural memory storage. For each of these processes individual differences and implications for emotional competence will be discussed and illustrated by research from the Geneva Emotion Research Group and other laboratories, raising the issue of potential measurement in passing. Time permitting, the issue of individual differences in the capacity to recognize emotional expressions as a major component of emotional competence will be considered. An attempt will be made to link this issue to the component process model by introducing the notion of "appraisal empathy". Current work of the Geneva group on

## SESSION ABSTRACTS

developing more appropriate measurement instruments, assessing modality specificity, will also be touched upon.

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### **Emotional Labor: A Psychological Perspective of Managing Emotions for a Wage** **Alicia Grandey (Pennsylvania State University)**

In this presentation, I will demonstrate the similarities and differences between a psychological perspective of emotional labor and emotional intelligence. The model of emotional labor discussed focuses on the role of emotional regulation performed by service workers, the fastest growing job category in the U.S. The presentation includes recent and ongoing research on the antecedents of emotion regulation such as display rules (e.g., “service with a smile!”), situational events (e.g., rude customers), and personality. Most critically, evidence from laboratory and field studies is presented that demonstrates the different consequences of these forms of emotion regulation, suggesting training and policy interventions.

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### **Emotions are to Personality as Weather is to Climate: Analogical Reasoning as a Tool for Scientific Investigation** **William Revelle (Northwestern University)**

Analogical reasoning has frequently been used in science as a means for applying knowledge about one domain to another domain. Earlier work (e.g., Atkinson and Birch, 1970; Kuhl and Blankenship, 1978; Revelle and Michaels, 1976, Revelle, 1995) has mapped the principal of inertia from classical physics to the study of personality and emotion. Just as mass relates to acceleration of physical objects in response to external forces, so do personality traits relate to rates of change in emotional state in response to external stimulation. That is, stable personality traits reflect how rapidly one changes values of emotional and behavioral states. Unfortunately, just as classical physics provides only a limited description of complex, turbulent phenomena such as weather or climate, so do simple inertial models of personality and motivation fail to predict the turbulent and chaotic experience of emotion.

I discuss how the analogy that *weather is to climate as emotions are to personality* furthers our understanding of the methodologies used to test (e.g., experimental studies of emotional responsiveness, factor analyses of emotional structure) theories of emotion and personality. Strengths and weaknesses of standard psychological analyses of emotion and personality are highlighted by applying the same techniques to the analysis of weather and climate. By examining what techniques work and do not work when studying weather and climate it is possible to choose between analytic procedures as they are applied to emotion and personality. Psychological data to be discussed include measures of the structure of emotion as measured between and within subjects over short and long periods of time. Stable individual differences in the structure of emotion will be related to individual differences in situational choice and to emotional reactions to situations.

## SESSION ABSTRACTS

### **Keynote Address**

### **Emotional Skills**

**Paul Ekman (University of California at San Francisco)**

**Paul Ekman** is Professor of Psychology and Director of the Human Interaction Laboratory at the University of California, San Francisco. In 1971, he received a Research Scientist Award from the National Institute of Mental Health; that Award has been renewed in 1976, 1981, 1987, 1991, and 1997. His research has been supported by fellowships, grants and awards from the National Institute of Mental Health for over forty years. In 1991 he received the Distinguished Scientific Contribution Award of the American Psychological Association, the highest award given for basic research. In 1994 he was given an honorary Doctor of Humane Letters from the University of Chicago. In 1998 he was named a William James Fellow of the American Psychological Society. In 2001 a scientific study of the most influential psychologists in the 20<sup>th</sup> century identified Ekman in the top 100. Articles reporting on Dr. Ekman's work have appeared in *Time* Magazine, *Smithsonian Magazine*, *Psychology Today*, *The New Yorker* and others, both American and foreign. Numerous articles have appeared in the *New York Times* and other newspapers about his work. He has appeared on 48 Hours, Dateline, Good Morning America, 20/20, Larry King, Oprah, Johnny Carson and other TV programs. He has been featured on various public television programs such as Bill Moyers' *The Truth About Lying*.

### **Session III: Related Constructs**

**Chair: Patrick C. Kyllonen (Educational Testing Service)**

This session will examine several concepts that share conceptual overlap with contemporary models of emotional intelligence. A major criticism leveled at emotional intelligence is that it is simply an old wine in a new bottle. This session will explore this prospect, as well as measurement approaches used in diverse fields to investigate constructs that would appear to share (if not, overlap) close correspondence with models of emotional intelligence.

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### **Conditional Reasoning: A New Approach to Personality Assessment**

**Lawrence James (University of Tennessee)**

A new approach to personality assessment is described. Referred to as the Conditional Reasoning Measurement System (James, 1998), this procedure focuses on how people solve what on the surface appear to be traditional inductive reasoning problems. The true intent of the problems is to determine if solutions based on implicit biases (i.e., biases that operate below the surface of consciousness) are logically attractive to a respondent. In this presentation, we focus on the types of implicit biases that underlie aggressive individuals' attempts to justify aggressive behavior. People who consistently solve problems using solutions based on these types of biases are scored as being "justifiers" because they are cognitively prepared to rationalize aggression.

## SESSION ABSTRACTS

Scores on the Conditional Reasoning Test for Aggression (CRT-A) have been shown to have acceptable psychometric properties and an average, uncorrected validity of .44 against behavioral indicators of aggression (in ten separate studies). These results are consistent with prior conditional reasoning studies on achievement motivation, and indicate that it is possible to make reasonably accurate assessments of personality dispositions, including dispositions such as aggression that people often attempt to deny or conceal. The results suggest further that it is possible to increase, perhaps substantially, our ability to predict whether people will behave aggressively in the future.

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### **What is Beyond the Big Five? – Isms and Other Personality Constructs** **Gerard Saucier (University of Oregon)**

Personality psychology presently focuses on the Big Five model as the individual differences worth measuring, but this focus is based on an overestimate of how well the Big Five represents the domain. Lexical studies of personality adjectives indicate that, compared to the Big Five, structures with one or two factors are markedly more replicable, and some structures with more than five factors (e.g., a Multi-Language Seven) appear just as replicable. Moreover, conventional variable-selection practices have led to the exclusion of several other important dimensions of individual differences from the Big Five taxonomy. A good example is social attitudes (or ideological beliefs). I present evidence, based on studies of the content of isms in a dictionary, that these are multidimensional and nearly independent of the Big Five – although they are included to some degree on some prominent personality questionnaires (e.g., 16PF, MPQ, TCI, NEO-PI-R). In order to examine whether such isms variables are important predictors of psychologically important behavioral patterns, I utilize self-report measures targeting emotional functioning that may be related to emotional intelligence. Isms factors accounted for substantial variation in these measures after that accounted for by lexically derived personality scales; indeed, for some of these measures, isms showed more predictive validity than did the personality measures. The dispositions underlying ideological beliefs deserve increased attention in studies of emotional as well as cognitive functioning.

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### **Social/Emotional Intelligence: From Factors to Functions** **Maureen O'Sullivan (University of San Francisco)**

Although different terms have been used (emotional intelligence, social intelligence, interpersonal sensitivity, empathy, the good judge of people) the definitions of these constructs are often almost identical. What differs is the way in which the construct is operationalized and the criteria used for determining accuracy. A brief and selective review of the first fifty years of social intelligence measurement will be contrasted with recent research on emotional intelligence. Early researchers emphasized factorial uniqueness of measures. Current researchers are more interested in emotionally intelligent behavior, broadly defined and studied in a variety of interpersonal and work

## SESSION ABSTRACTS

situations. Comments about what is known and unknown about emotional intelligence will be organized in the context of published studies of lie detection accuracy and preliminary results from an idiographic analysis of 29 “wizard” lie detectors. These highly emotionally intelligent people obtained very high scores on several different lie detection tasks. Although most people obtain scores close to 50% on these tasks, the wizards of lie detection received scores of 80% or better. The study is ongoing, but preliminary observations relevant to the role of experience, training, nonverbal behavior, personality, self-ratings of emotional intelligence and motivation will be discussed.

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**Social Intelligence: Attentiveness and Politeness in Learner-Computer Interaction**  
**W. Lewis Johnson (University of Southern California)**

This paper addresses the problem of making animated pedagogical agents, or guidebots, more empathetic in their interactions with learners. This involves providing guidebots with a degree of social intelligence. In particular, two aspects of social intelligence are critical: attentiveness and politeness. Attentiveness involves being able observe learner behavior closely in order to infer cognitive and motivational states, and respond to difficulties when they occur. Politeness involves interacting in a manner that is sensitive to the social relationship between the learner and the guidebot, and the impact of interventions on learner attitudes, so as to minimize face threat and enhance learner motivation. We have implemented both capabilities in the context of a guidebot to assist in industrial engineering problem solving.

**Session IV: Assessment**  
**Chair: Richard D. Roberts (Educational Testing Service)**

This session concerns approaches to the measurement of emotional intelligence and related constructs. Presently, there appear some problems with several of these approaches and a sub-theme of this session will be to explore alternative perspectives that may circumvent some of these problems.

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**Self- and Peer-Report Assessments of Emotional Intelligence**  
**Fabio Sala (The HayGroup)**

David McClelland’s influential 1973 paper encouraged researchers and practitioners to test for “competence rather than intelligence.” Since then, a rigorous qualitative method (Behavioral Event Interview) has been developed to uncover the behaviors, thoughts, and feelings that predict performance in a variety of settings (e.g., Boyatzis, 1982, *The competent manager: A model for effective performance* [New York: John Wiley & Sons]). This work led to a sample of generic competencies that were entirely empirically derived; interviews with job incumbents revealed behaviors, thoughts, and feelings that led to success in a wide variety of jobs and situations. It became evident from this work that most of these characteristics were largely based in emotion; that is, awareness of

## SESSION ABSTRACTS

emotion in oneself and others and appropriate emotion management seemed to be an important basis for many competencies.

This work largely served as the foundation for the Emotional Competence Inventory (ECI). The ECI is a 72-item multi-rater survey that assesses 18 competencies within 4 clusters: self-awareness, self-management, social awareness, and relationship management (Goleman, 1998, *Working with emotional intelligence* [New York: Bantam]). Items reflect behaviors that are characteristic of those who have demonstrated outstanding performance in a variety of workplace situations.

Quantitative research will be presented to show the psychometric strengths and limitations of the ECI, the benefits and challenges of self- and other-assessment versions, and the degree to which ECI ratings predict important (mostly workplace) outcomes.

*“Knowns and Unknowns”*. The ECI does a good job predicting performance (e.g., effective call center agents) and it demonstrates acceptable reliability. Factor analysis reveals problems with the survey and the underlying theoretical foundation of “emotional intelligence competencies.” Competencies are too intercorrelated and one relatively large factor casts doubt that 18 competencies can really be distinguished from one another (at least with this method of assessment). The reliable and valid assessment of EI competencies is challenging. For example, competencies are not independent—like their personality counterparts. Finally, the empirically driven nature of competencies reveals that they are sometimes nonlinear and noncumulative.

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### **Performance-Based Emotional Intelligence**

**John (Jack) D. Mayer (University of New Hampshire)**

The theory of emotional intelligence (EI) is described. First, emotions are defined, then emotional information, then intelligence, then EI. A four-part model of emotional intelligence is introduced, along with a measurement instrument to assess it, the MSCEIT (Mayer-Salovey-Caruso Emotional Intelligence Test). Hypothesis testing with the instrument tells us a number of things about emotional intelligence: (a) There are better and worse answers to each item, (b) the ability to find the correct answers in a variety of emotional problem-solving domains can be successfully modeled as a unitary ability, (c) EI can be measured reliably, and (d) EI represents a new type of ability that makes interesting predictions to real life phenomena.

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## SESSION ABSTRACTS

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### **Consensus-Based Measurement**

**Peter Legree & Joseph Psotka**

**(U.S. Army Research Institute for the Behavioral and Social Sciences)**

Situational judgment tests have been developed in the fields of Industrial/Organizational and Cognitive Psychology to predict performance and to evaluate theories of cognition. Production of these scales has usually required the opinions of subject matter experts to produce scoring keys or criterion data to compute empirically based standards. A simpler, more cost-efficient procedure is considered that allows examinee responses to be scored as deviations from the consensus defined by the response distributions of the examinee sample. This approach is termed "Consensus Based Measurement" and has been applied to validate scales in domains that lack certified experts, such as Emotional Intelligence. Data are summarized demonstrating substantial convergence between situational judgment tests scored using expert and examinee based scoring standards computed without reference to criterion data for which substantial expert and examinee data are available. The convergence indicates that examinee response distributions may be used to score situational judgment tests when expert responses are not available. Validity data are summarized that utilized this approach to score situational judgment scales.

### **Performance and Biological Mapping of Emotional Awareness**

**Richard Lane (University of Arizona)**

While awareness of one's own emotions is thought to be one component of emotional intelligence, it may be a particularly important or primary component in the sense that it may be the foundation for the successful implementation of the other components of emotional intelligence. In the first part of this talk I will present a theoretical model that I developed with Gary Schwartz called "levels of emotional awareness." The basic idea is that emotional awareness is a cognitive skill that goes through a developmental process similar to that which Piaget described for the development of intelligence. I will then present findings in normative and clinical contexts using the Levels of Emotional Awareness Scale (LEAS), which is a performance measure of the ability to be aware of one's own and others' emotional states. The LEAS has strong psychometric properties and appears to tap aspects of emotional intelligence that distinguish it from other measures. In the second part of the talk our current understanding of the neural substrates of emotional experience will be reviewed. Drawing upon functional neuroimaging data, the neural substrates of implicit emotion, background feelings, attention to feelings, and reflection upon feelings are considered. Parallels in the hierarchical organization of the psychological and neuroanatomical models will be discussed. Current evidence suggests that the neural substrates of implicit emotional processes (involuntary or automatic visceromotor and somatomotor expressions of emotion) are unique to emotion whereas the neural substrates of explicit emotional processes are domain-general. The latter means that the conscious experience of emotion competes with other mental contents for conscious processing, which may be one of the reasons why there are such vast

## SESSION ABSTRACTS

individual differences in emotional intelligence. In the final part of the talk I will consider how emotional intelligence can be promoted using principles derived from the levels of emotional awareness model. In the case of maladaptive behavior the fundamental process involves the transformation from implicit to explicit processing, just as in cognitive development more generally.

### **Session V: Applications**

**Chair: Gerald Matthews (University of Cincinnati)**

A major impetus of emotional intelligence is tied to its potential applications in many fields, including the workplace, human factors, gerontology, and education. In this session, experts will give their perspective on the utility of emotions in these broad domains.

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#### **The Impact of Emotionally and Socially Intelligent Behavior on Performance Reuven Bar-On (University of Texas Medical Branch)**

This presentation discusses the impact of emotionally and socially intelligent behavior on human performance. In the first part of the presentation, the way emotional and social competence is defined and measured in the studies that are presented is explained. This includes a brief description of the Emotional Quotient Inventory (EQ-i) and how it was developed, normed and validated. In addition to the instrument's internal consistency and retest stability, the construct validity of the EQ-i is discussed supported by moderately high to high correlations with a number of instruments that were designed to assess various aspects of emotional and social competence. The use of this self-report measure to assess the construct upon which it was developed is empirically justified based on findings obtained from multi-rater assessments made by significant others and based on findings from a study of anosognostic brain-damaged patients. The second part of the presentation focuses primarily on the predictive validity of the EQ-i by discussing findings from a number of studies which suggest that emotionally and socially intelligent behavior is significantly related to academic and occupational performance as well as physical and psychological wellness. In conclusion, applications of what we now know about emotional and social competence are discussed. This includes decision-making based on EQ-i results in schools, organizations and healthcare settings. Rather than relying on one particular assessment modality, be it self-report, multi-rater or abilities evaluations, the possibilities of a multi-modal approach are explored.

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## SESSION ABSTRACTS

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### **Building Success in School and Life Through Social and Emotional Learning** **Joseph Zins (University of Cincinnati)**

Students today face many significant challenges as they grow up in a world being transformed by tremendous social and technological change, resulting problems such as interpersonal violence, substance abuse, access to health-damaging media messages, and unethical behaviors. Schools have the opportunity to help children cope with and adapt to these issues so that they increase their chances of being successful in school and in life. This presentation provides an overview of current social and emotional learning (SEL) instruction in schools. The definition and essential elements of such efforts are presented, a model of its conceptual links to school success is provided, and examples of research support for SEL interventions are reviewed. Based on an examination of the field's evidence base found in studies of school preventive interventions, mental health and positive youth development, and substance abuse prevention, it is clear that there are consistent research findings on the effectiveness of SEL instruction, thereby supporting the scaling up of such interventions in schools.

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### **Emotions in the Workplace** **Ruth Kanfer (Georgia Institute of Technology)**

Work arguably represents the most ubiquitous influence on adult adjustment and well-being. Emotional experiences at work and workplace demands on emotion regulation have long been recognized to affect employee behavior, job performance, mental health, and physical health. Surprisingly, relatively little is known about the determinants, consequences, or character of emotional experiences in these environments. In this paper, I describe organizational psychology progress on work-related emotions and emotion regulation. Four streams of theory and research are discussed: (a) emotional labor, (b) trait influences on emotional attitudes, (c) work demands on emotional attitudes, and (d) emotional episodes. An integrative, heuristic framework is proposed that delineates the common and unique emotion regulation demands associated with leadership, teamwork, and task performance. Implications of this framework for future research are also presented.

## SESSION ABSTRACTS

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**Playing Well With Others: Emotional Intelligence Meets Team Performance**  
**Nancy Cooke (Arizona State University East)**

What role does emotional intelligence play in the effectiveness of a team? Assuming that one aspect of emotional intelligence is the ability to “play well with others,” then there should be direct implications for having high EI individuals on your team. However, there are several ways in which this view may be overly simplistic. For instance it tends to neglect other potential interacting factors such as team structure, team roles, and team process behaviors. Due to these factors it may be the case that the EI that emerges at the team level is quite different from the aggregate of the EI of the individual team members. Our work on team cognition in which the cognition of the team is viewed as an emerging phenomenon may provide a useful analogy for thinking about team emotion. In this talk I will describe our view of team cognition, along with some of the associated challenges of assessing team cognition and some responses to those challenges.

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**Emotion and Aging: An Information Processing Perspective**  
**Derek M. Issacowitz (Brandeis University)**

Recent evidence has pointed to an impressive resilience of the emotion and affect systems as individuals age. After describing this data, some of which suggests that older adults may even have more positive affective profiles on average than their younger counterparts, socioemotional selectivity theory will be presented as a motivational account of why the news may be so good in the field of affect and aging. Then, the information processing mechanisms underlying these age effects will be considered, focusing on biases and preferences in attention and memory across the adult lifespan. Finally, the question of links between emotional intelligence and aging specifically will be considered.

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## POSTER SESSION

**Poster Session (November 13-15)**

**Chair: Pippa M. Markham (Educational Testing Service)**

Posters will be presented in the Sundial Room at Chauncey Conference Center for the duration of the conference. Feel free to browse at your leisure.

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### **Emotional Intelligence and Money Attitudes**

**Elisabeth Engelberg**

**Stockholm School of Economics, Sweden**

The purpose of the present study was to investigate the extent to which money attitudes relate to Emotional Intelligence (EI). The relation between EI and money attitudes is of interest since research has shown that money tends to be imbued with salient emotions, and EI may, consequently, shed some light on the ability to cope with money related issues. Furthermore, economic factors, including beliefs and attitudes, play a major role in modern life and their interplay with both traditional and more recent psychological concepts should be of interest in psychology. The study included a sample of 212 respondents who filled out a questionnaire with items of the Money Attitude Scale (MAS) developed by Yamauchi and Templer (1982). The questionnaire further included scales for facets of EI, a test of EI performance consisting of judging emotions in facial expressions, and a measure of the balance between work and leisure. Results suggested that high levels of EI imply a less pronounced orientation toward money, less negative money associations, and a greater sense of self-efficacy with regard to personal economic issues. Another finding was that money orientation seems to be linked to a less degree of social integration. Future studies should further explore the inter-connection between money attitudes and EI, as well as social competence/intelligence as related to EI.

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### **A Generalizability Perspective on MSCEIT**

**Hallvard Follesdal**

**University of Oslo, Norway**

The aim of this study was to investigate the psychometric properties of scores from 85 leaders on the Norwegian adaptation of the Mayer, Salovey, and Caruso Emotional Intelligence Test (MSCEIT), driven by a generalizability perspective. Due to a small sample and the multifaceted structure of the test, Generalizability Theory (Cronbach et al. 1972, Brennan, 2001) was used to estimate reliability, including the relative size of variance components derived from the test design. The MSCEIT has a design with several facets: Four branches encompassing eight tasks, each consisting of a set of stimuli

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to be rated on several items. The analysis showed that two different methods for scoring correct answers (expert and consensus) had only a trivial impact on variance in the test, supporting the exchangeability of the scoring methods. Different implications derived from generalizability-theory are discussed.

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### **What Makes a Situation Emotional? A Qualitative Analysis of Emotional Incidents in an Australian Population**

**Carolyn MacCann**  
**University of Sydney, Australia**

A broad investigation of the contents of emotional incidents was conducted with an Australian sample of undergraduates ( $N=35$ ) and community members ( $N=19$ ). Semi-structured interviews asking participants to describe in their own words a time when they felt emotion were transcribed and subjected to a NUD\*IST semantic analysis. Several general themes were identified, the most frequent being: (i) unfairness or injustice, (ii) money and finances, (iii) fighting, (iv) put-downs, (v) achievement, (vi) role change, (vii) rudeness, (viii) secrecy, (ix) celebrations, (x) intoxicated behavior, and (xi) losing friendship or closeness. Different themes were associated with different emotions, emotional intensities (high, medium, and low), and domains (family versus work). Demographic variables were also related to the reporting of particular themes and emotions. Characteristics of emotional incidents are discussed in terms of structural theories of emotions, and the possibility of using this information as the basis for item construction for tests of emotion management. The advantages and disadvantages of the use of NUD\*IST for this type of analysis is also explored.

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### **Emotions as a Management Fashion: A Critical Analysis of Daniel Goleman's Construction of Emotional Intelligence and Competence**

**Barbara Sieben**  
**FU Berlin, Institute for Management – Personnel Policy**

Emotions at work are gaining interest in management research and practice. I concentrate on a critical outcome of this development: the creation of commodifiable concepts which put a clear focus on manageability, reducing emotions to factors of economic value and requirements of emotional labor to individual competencies. I demonstrate that Goleman's EI-version is a typical example of such a tailoring of a management fashion. This EI-version is further analyzed

## POSTER SESSION

- from a methodological perspective, unveiling the author's science claim as a rhetorical strategy that enhances the commodity character of EI.
  - from a political perspective, highlighting that this view on emotions oversimplifies highly complex phenomena, and it ignores possible costs and side-effects for managers and those who are managed.
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### **The Implications of 'The Positive Theory of Emotion' in a Learning and Education Context**

**Christian Valla & Nikolaj Ilsted Bech**

**Learning Lab Denmark, Copenhagen, Denmark**

The outset for this Ph.D.-project entitled: "Emotions, body, and learning", is "the positive view of emotions", which implies that emotions can qualify our decisions in an intentional and rational way. The goal of this project is to theoretically explore and interpret 'the positive theory of emotions' within in the context of education and pedagogy.

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### **Persuasion and Emotional Intelligence: Applying Emotional Intelligence Research to Persuasion Training and Identifying Areas for Future Research**

**Abigail M. Wild**  
**Harvard College**

Persuasion has been considered by many to be of central importance to both personal and professional success in life and critical to effective leadership. Emotional intelligence is of particular interest to persuasion researchers because of the high degree of overlap of these two constructs: the ability to understand and influence our own emotions and the emotions of others are centrally important both to emotional intelligence and to persuasion research. This work, conducted with Professor Gary Orren at Harvard's Kennedy School of Government, explores the application of emotional intelligence research to the subject of persuasion, including both the theoretical and practical implications of the connections between the two.

The construct of emotional intelligence is highly applicable to three main points about persuasion: 1) Persuasion is important to both personal and professional success. 2) Persuasion abilities are not entirely innate and can be improved. 3) Improvements in persuasion ability can lead to greater success in life. It appears that much of the impetus for emotional intelligence research stems from a sense that comparable statements could be made about emotional intelligence and in fact these claims are made in current literature, especially popular literature. This project outlines avenues of potential

## POSTER SESSION

application of emotional intelligence research to persuasion and identifies areas within the study of emotional intelligence that merit further research.

## **SURVIVAL KIT**

### **Conference location**

The conference will take place at the Chauncey Conference Center, located on the grounds of Educational Testing Service. Registration will be held at the front lobby in the Conference Center. There are break stations throughout the building, including outside of the meeting rooms, and participants can help themselves to any of these break stations. Sessions will take place in The Barn.

### **Conference dinners**

The conference dinner on Thursday, November 13<sup>th</sup> will be held at The Prospect House, Princeton University, from 6.30 p.m. – 9:30 p.m. Buses will depart from ETS at 6.15 pm. The conference dinner on Friday, November 14<sup>th</sup> will take place in the Solomon Room, located in the Chauncey Conference Center, at 6.00 pm.

### **Parking**

Parking is free at Chauncey Conference Center, and is located directly in front of the Conference Center.

### **Computer access**

Each guest room at the Chauncey Conference Center is equipped with internet access if you have your own laptop. Additionally, there will be three computers with internet access provided for your use in the Chauncey Conference Center, on the same floors as the meeting rooms.

### **Transport information line**

NJ transit, buses and trains  
(800) 772-2222  
6:00 a.m. to midnight daily  
For schedules: <http://njtransit.com>

### **Taxi / Shuttle Services**

To order a taxi, phone AAA Taxi: (609) 921 1177 or Dean's Taxi: (609) 921 7551

For the Princeton Airporter Shuttle: 1-800-385-4000 (\$23 one way to Newark) (\$43 on way to JFK)

## SURVIVAL KIT

### Emergency Numbers

Chauncey Conference Center 609 921 3600  
For ambulance, Fire or Police, phone 911

### Guide to the local area

For a guide to the local area, please refer to the Princeton Packet online:  
<http://www.pacpubserver.com/new/business/tourism.html>

### Nightlife in Princeton

#### Live Music:

Triumph Brewing Company  
138 Nassau Street  
Princeton, New Jersey 08542  
Tel: 609 924 7855  
Email: <http://www.triumphbrew.com/red.html>

Waffle Haus (Thursday, Nov. 13) Classic and Contemporary Covers  
The Bluehawks Band (Friday, Nov. 14) Hard rock blues, R&B, and Soul  
Unnamed (Saturday, Nov. 15) Acoustic pop rock and alternative rock

Mediterra, a Mediterranean/Italian restaurant on Palmer Square, offers live jazz music three nights a week. Less than a block away, the Yankee Doodle Tap Room at the Nassau Inn also features live jazz music every Thursday night, from 7-10 pm. "People are always looking for places to go," says Ricky Kirby, manager of the Tap Room, which also books R&B and Top 40 band music on Friday and Saturday nights, when it stays open until 1:30 am.

#### Dancing:

The Culture Club  
Dancing & 80s music Wednesday, Thursday, Friday, & Saturday  
@ Westin Hotel in Forrestal Village  
201 Village Boulevard  
Princeton, NJ 08540  
Tel: 609 452 7900

### Travel to New York City

Chauncey Conference Center has a free shuttle to Princeton Junction Train Station. The New Jersey Transit system offer trains at @\$13.00 one way, which take you from Princeton Junction directly to Penn Station in NYC.

## BRIEF BIOGRAPHICAL SKETCH

### REUVEN BAR-ON

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### Brief Biographical Sketch:

**Reuven Bar-On** has worked as a clinical psychologist since 1972. He earned his doctorate at Rhodes University and presently holds a faculty appointment at the University of Texas Medical Branch where he directs emotional intelligence research. Dr. Bar-On is an internationally acknowledged expert and pioneer in emotional intelligence and has been involved in defining, measuring and applying various aspects of this construct since 1980. During his doctoral studies in South Africa, he coined the term “EQ” (“emotional quotient”) to describe his approach to assessing the conceptual model he was developing. Dr. Bar-On created the Emotional Quotient Inventory (EQ-i), which is described as the first test of emotional intelligence to be published by a psychological test publisher and reviewed by the *Buros Mental Measurement Yearbook*. He co-edited the *Handbook of Emotional Intelligence* (2000) which is one of the first scientific texts on this topic. He has been involved in numerous research projects related to emotional intelligence over the past two decades, among them is the first longitudinal study of this construct which is studying its relationship with biomedical, cognitive, social and educational factors over a 25-year period. Together with colleagues in Antonio Damasio’s laboratory at the University of Iowa, Dr. Bar-On recently published the first peer-reviewed paper on the neurological foundations of “emotional and social intelligence” as he refers to this conceptual model.

### Selected Publications:

- Bar-On, R. (1997). *Bar-On Emotional Quotient Inventory (EQ-i): Technical manual*. Toronto, Canada: Multi-Health Systems.
- Bar-On, R. (2000). Emotional and social intelligence: Insights from the Emotional Quotient Inventory (EQ-i). In Reuven Bar-On and James D.A. Parker (Eds.), *Handbook of emotional intelligence*. San Francisco: Jossey-Bass.
- Bar-On, R. (2001). Emotional intelligence and self-actualization. In Joseph Ciarrochi, Joe Forgas, and John D. Mayer (Eds.), *Emotional intelligence in everyday life: A scientific inquiry*. New York: Psychology Press.

## BRIEF BIOGRAPHICAL SKETCH

- Bar-On, R., Brown, J. M., Kirkcaldy, B. D., & Thome, E. P. (2000). Emotional expression and implications for occupational stress: An application of the Emotional Quotient Inventory (EQ-i). *Journal of Personality and Individual Differences*, 28, 1107-1118.
- Bar-On, R., & Handley, R. (2003). *Bar-On EQ-360: Technical manual*. Toronto, Canada: Multi-Health Systems.
- Bar-On, R., Handley, R., & Fund, S. (in press). The impact of emotional intelligence on performance. In Vanessa Druskat, Fabio Sala, and Gerald Mount (Eds.), *Linking emotional intelligence and performance at work: Current research evidence*. Mahwah, NJ: Lawrence Erlbaum.
- Bar-On, R., & Orme, G. (2002). The contribution of emotional intelligence to individual and organizational effectiveness. *Competency*, 9(4), 23-28.
- Bar-On, R., & Parker, J. D. A. (2000). *Emotional Quotient Inventory Youth Version (EQ-i:YV): Technical manual*. Toronto, Canada: Multi-Health Systems.
- Bar-On, R., Tranel, D., Denburg, N. L., & Bechara, A. (2003). Exploring the neurological substrate of emotional and social intelligence. *Brain*, 126, 1790-1800.
- Bar-On, R., & Parker, J. D. A. (2000). *Handbook of Emotional Intelligence*. San Francisco: Jossey-Bass.

## BRIEF BIOGRAPHICAL SKETCH

### LISA FELDMAN BARRETT

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### Brief Biographical Sketch:

In everyday life, when we want to know something about people, we typically ask them a question, and, all things being equal, we assume their responses contain important information. Likewise, for over half a century, psychologists have relied on self-report: asking questions of individuals. For example, experimental participants have been asked, “How depressed do you feel, on a scale from one to seven?” or “How close do you feel to your partner?” Based on these reports, psychological theories have been built about emotion, personality, and other complex issues of human nature. Unfortunately, these verbal reports which work fine for everyday life are problematic for scientists who argue that self-reports are trivial or not valid. Psychology has often been criticized as a “soft science” because of this reliance on self-report.

Of course, verbal reports are not windows on the mind. They are more like kaleidoscopes that transform our view. If we can describe the contents of what we see, and understand the rules of transformation, then we can construct a clearer view of the mind. I have spent most of my career characterizing the content of people’s self-reports, developing a theory to explain the processes by which such reports are generated, and enhancing the methodological tools that can be brought to bear in this domain. The majority of my research is multi-method, involving experience-sampling methods, standard laboratory experiments, psychophysiological measurements, and standard self-report procedures. I have applied this set of methods to understand a range of topics related to human emotion, including representations of emotional experience, emotional intelligence, and sex differences in emotion. I have also applied them to related topics, such as interpersonal relationships and defensiveness. My most recent work links several types of responses (e.g., experience-sampling reports, standard self-report responses to questionnaires, and responses to so-called implicit tests) to concepts developed in the philosophy of consciousness and the cognitive science of memory.

## BRIEF BIOGRAPHICAL SKETCH

### Selected Publications:

- Feldman, L. A. (1995). Valence focus and arousal focus: Individual differences in the structure of affective experience. *Journal of Personality and Social Psychology*, 69, 153-166.
- Feldman Barrett, L. (1998). Discrete emotions or dimensions? The role of valence focus and arousal focus. *Cognition and Emotion*, 12, 579-599.
- Feldman Barrett, L., Gross, J., Conner, T., & Benvenuto, M. (2001). Emotion differentiation and regulation. *Cognition and Emotion*, 15, 713-724.
- Feldman Barrett, L., & Salovey, P. (Eds.). (2002). *The wisdom in feeling: Processes underlying emotional intelligence*. New York: Guilford.
- Feldman Barrett, L., & Russell, J. A. (1998). Independence and bipolarity in the structure of current affect. *Journal of Personality and Social Psychology*, 74, 967-984.
- Feldman Barrett, L., & Russell, J. A. (1999). Structure of current affect. *Current Directions in Psychological Science*, 8, 10-14. (Invited contribution).
- Fossum, T., & Feldman Barrett, L. (2000). Evaluation and description in the personality-emotion relationship. *Personality and Social Psychology Bulletin*, 26, 669-678.
- Kring, A. M., Feldman Barrett, L., & Gard, D. (2003). On the broad applicability of the affective circumplex: Representations of affective knowledge in schizophrenia. *Psychological Science*, 14, 207-214.
- Ochsner, K., & Feldman Barrett, L. (2001). The neuroscience of emotion. Chapter in T. Mayne & G. Bonnano (Eds.), *Emotion: Current Issues and Future Directions*. New York: Guilford.
- Russell, J. A., & Feldman Barrett, L. (1999). Core affect, prototypical emotional episodes, and other things called emotion: Dissecting the elephant. *Journal of Personality and Social Psychology*, 76, 805-819.

## BRIEF BIOGRAPHICAL SKETCH

### AARON BEN ZE'EV

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### Brief Biographical Sketch:

**Aaron Ben-Zeev** is Professor of Philosophy and Rector at the University of Haifa. He is the co-director of the Center for Inter-Disciplinary Research on Emotions. His research focuses on the philosophy of mind -- particularly the emotions. In addition to numerous articles, his publications include: *Aristotle on the Soul* (1989); *The Perceptual System* (1993); *The Subtlety of Emotions* (2000); *Love Online: Emotions on the Internet* (2004), and a co-edited volume on *Good Gossip* (1994).

### Selected Publications:

*Love Online: Emotions on the Internet* (Cambridge: Cambridge University Press, 2004).

*The Subtlety of Emotions* (Cambridge, MA: MIT Press, 2000).

"Emotions as a General Mental Mode," in R. Solomon (Ed.) *Thinking about Feeling: Contemporary Philosophers on Emotion* (Oxford: Oxford University Press, 2003).

"Privacy, Emotional Closeness, and Openness in Cyberspace," *Computers in Human Behavior*, 19 (2003), 451-467.

"Emotions Are Not Mere Judgments," *Philosophical and Phenomenological Research* (2003).

"The Logic of Emotions," In A. Hatzimoysis (Ed.), *Philosophy and the Emotions* (147-162), (Cambridge: Cambridge University Press, 2003).

"Intentionality and Feelings in Theories of Emotion," *Consciousness & Emotion*, 3 (2002), 263-271.

"Emotional Intelligence: The Conceptual Issue," in N. Ashkanasy, Zerbe & Harteland (Eds.), *Emotions in the Workplace* (New York: M.E. Sharpe, 2002), 164-183.

## BRIEF BIOGRAPHICAL SKETCH

“I Only Have Eyes For You: The Partiality of Positive Emotions,” *Journal for the Theory of Social Behaviour*, 30 (2000), 341-351.

## BRIEF BIOGRAPHICAL SKETCH

### **NANCY COOKE**

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### **Brief Biographical Sketch:**

**Nancy J. Cooke** is currently a Professor in the Applied Psychology Program at Arizona State University East. She also holds a National Research Council Associateship position with Air Force Research Laboratory through July 2004 and serves on the Board of Directors of the Cognitive Engineering Research Institute in Mesa, AZ. She received her Ph.D. in cognitive psychology in 1987 from New Mexico State University, served on the Psychology faculty at Rice University from 1987-1992, and returned to New Mexico State in 1992. She supervises graduate and undergraduate research in the CERTT Laboratory for Cognitive Engineering Research on Team Tasks. The CERTT Lab was developed by Dr. Cooke and US Positioning, LLC with DOD support and contains four interconnected participant consoles and one experimenter control console each with a variety of computer, communication, and data recording devices. The mission of this lab is to develop, apply, and evaluate measures of team cognition.

Dr. Cooke's research interests include the study of knowledge and its application to the development of cognitive and knowledge engineering methodologies, as well as to expertise, intelligent tutors, human-computer interfaces, and team performance. In particular, Dr. Cooke specializes in the development, application, and evaluation of methodologies to elicit and assess individual and team knowledge. Her most recent work includes the development and validation of methods to measure shared knowledge and team situation awareness and research on the impact of cross training, distributed mission environments, and workload on team knowledge, process, and performance.

Dr. Cooke's work appears in over 70 articles, chapters, and technical reports and been presented at numerous workshops, conferences, and invited colloquia. Dr. Cooke has had experience conceptualizing, designing, and directing research in a variety of applied settings and her most recent research has been funded by the Air Force Office of Scientific Research, NASA Ames Research Center, and the Office of Naval Research. Dr. Cooke is a fellow of the Human Factors and Ergonomics Society. She is also

## BRIEF BIOGRAPHICAL SKETCH

Associate Editor of Human Factors and International Journal of Human-Computer Studies and on the editorial board of Journal of Experimental Psychology: Applied.

### **Selected Publications:**

Cooke, N. J., Kiekel, P.A., Salas, E., Stout, R.J., Bowers, C., Cannon-Bowers, J. (in press). Measuring Team Knowledge: A Window to the Cognitive Underpinnings of Team Performance. *Group Dynamics: Theory, Research and Practice*.

Cooke, N. J., & Shope, S. M. (2002). The CERTT-UAV Task: A Synthetic Task Environment to Facilitate Team Research. *Proceedings of the Advanced Simulation Technologies Conference: Military, Government, and Aerospace Simulation Symposium* (pp. 25-30). San Diego, CA: The Society for Modeling and Simulation International.

Cooke, N. J., Kiekel, P. A., & Helm E. (2001). Measuring team knowledge during skill acquisition of a complex task. *International Journal of Cognitive Ergonomics: Special Section on Knowledge Acquisition, 5*, 297-315.

Kiekel, P. A., Cooke, N. J., Foltz, P. W., & Shope, S. M. (2001). Automating measurement of team cognition through analysis of communication data. In M. J. Smith, G. Salvendy, D. Harris, and R. J. Koubek (Eds.), *Usability Evaluation and Interface Design* (pp. 1382-1386). Mahwah, NJ: Lawrence Erlbaum Associates.

Cooke, N. J., Salas, E., Cannon-Bowers, J. A., & Stout, R. (2000). Measuring team knowledge. *Human Factors, 42*, 151-173.

Cooke, N. J. (1999). Knowledge elicitation. In F.T. Durso, (Ed.), *Handbook of Applied Cognition* (pp. 479-509). UK: Wiley.

Cooke, N. J., Rivera, K., Shope, S. M., & Caukwell, S. (1999). A synthetic task environment for team cognition research. *Proceedings of the Human Factors and Ergonomics Society 43rd Annual Meeting*, 303-307.

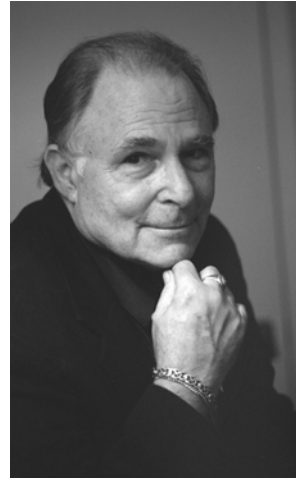
Cooke, N. J., & Neville, K. J., & Rowe, A. L. (1996) Procedural network representations of sequential data. *Human-Computer Interaction, 11*, 29-68.

Cooke, N. J. (1994). Varieties of knowledge elicitation techniques. *International Journal of Human-Computer Studies, 41*, 801-849.

## BRIEF BIOGRAPHICAL SKETCH

### PAUL EKMAN

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### Brief Biographical Sketch:

**Paul Ekman** was an undergraduate at the College of the University of Chicago and New York University. He received his Ph.D. in clinical psychology at Adelphi University (1958), after an internship at the Langley Porter Neuropsychiatric Institute. After two years as a Clinical Psychology Officer in the U.S. Army, he returned to Langley Porter where he has been since 1960. His research on facial expression and body movement began in 1954, as the subject of his Master's thesis in 1955 and his first publication in 1957. In his early work his approach to nonverbal behavior showed his training in personality. Over the next decade a social psychological and cross-cultural emphasis characterized his work, with a growing interest in an evolutionary and semiotic frame of reference. In addition to his basic research on emotion and its expression, he has, for the last thirty years, also been studying deceit.

Currently he is Professor of Psychology and Director of the Human Interaction Laboratory at the University of California, San Francisco. In 1971, he received a Research Scientist Award from the National Institute of Mental Health; that Award has been renewed in 1976, 1981, 1987, 1991, and 1997. His research has been supported by fellowships, grants and awards from the National Institute of Mental Health for over forty years.

In 1991 he received the Distinguished Scientific Contribution Award of the American Psychological Association, the highest award given for basic research. In 1994 he was given an honorary Doctor of Humane Letters from the University of Chicago. In 1998 he was named a William James Fellow of the American Psychological Society. In 2001 a scientific study of the most influential psychologists in the 20<sup>th</sup> century identified Ekman in the top 100.

Articles reporting on Dr. Ekman's work have appeared in *Time* Magazine, *Smithsonian* Magazine, *Psychology Today*, *The New Yorker* and others, both American and foreign.

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Numerous articles have appeared in the New York *Times* and other newspapers about his work.

He has appeared on 48 Hours, Dateline, Good Morning America, 20/20, Larry King, Oprah, Johnny Carson and other TV programs. He has been featured on various public television programs such as Bill Moyers' *The Truth About Lying*.

### **Selected Publications:**

Ekman is co-author of *Emotion in the Human Face* (1971), *Unmasking the Face* (1975), *Facial Action Coding System* (1978), editor of *Darwin and Facial Expression* (1973), co-editor of *Handbook of Methods in Nonverbal Behavior Research* (1982), *Approaches to Emotion* (1984), *The Nature of Emotion* (1994), *What the Face Reveals* (1997), and author of *Face of Man* (1980), *Telling Lies* (1985, paperback, 1986, second edition, 1992, third edition, 2001), *Why Kids Lies* (1989, paperback 1991), and *Emotions Revealed*, (2003). He is the editor of the third edition of Charles Darwin's *The Expression of the Emotions in Man and Animals* (1998). He has published more than 100 articles.

## BRIEF BIOGRAPHICAL SKETCH

### PAUL A. GADE

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### Brief Biographical Sketch:

**Dr. Paul A. Gade**, a Vietnam Era Air Force veteran, is a senior research psychologist and the chief of the Basic Research Office at the U.S. Army Research Institute for the Behavioral and Social Sciences. He received his BA in psychology from Hiram College and his MS and Ph.D. in experimental psychology from Ohio University. Dr. Gade is a member of the Personnel Testing Council of Metropolitan Washington, a fellow of the Inter-University Seminar on Armed Forces and Society and the American Psychological Association and past president of the Association's Division of Military Psychology. In 2001, he received the Division's prestigious Charles S. Gersoni Award for outstanding contributions to military psychology. Dr. Gade has published more than sixty book chapters, journal articles, magazine articles, and technical reports and is an Associate Editor of the journal *Military Psychology*.

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### **Brief Biographical Sketch:**

**Drew H. Gitomer** is the senior vice president of Research & Development at Educational Testing Service in Princeton, NJ. He earned his Ph.D. in cognitive psychology at the University of Pittsburgh in 1984. Gitomer joined ETS in 1985. He now oversees the ETS divisions responsible for research, assessment design, product development, and the National Assessment of Educational Progress (NAEP).

Gitomer's current research interests include policy and evaluation issues related to teacher education, licensure, induction, and professional development. Current studies are geared towards enhancing the validity base for teacher licensure assessments (Praxis™) as well as advanced certification of teacher assessments (National Board for Professional Teaching Standards).

From 1991 to 1995, Gitomer was the project codirector for SEPIA, Science Education through Portfolio Instruction and Assessment, which was funded by the National Science Foundation and the University of Pittsburgh. In 1991–92, he served as project director for Assessments in Science Education, which was funded by the National Science Foundation with Rutgers University. He also was project codirector of Arts PROPEL, a portfolio assessment effort involving middle and high school teachers and students in music, visual arts, and writing. In addition, Gitomer led an effort to develop an interactive video-based intelligent tutoring system to help users develop skill in technical troubleshooting of aircraft hydraulic systems. The system was designed to assess and improve users' mental models of aircraft systems, troubleshooting strategies, and procedural problem-solving skills by providing them with guided opportunities to engage in simulated troubleshooting activity.

Gitomer serves as principal investigator, sponsor, and collaborator of research for the National Board for Professional Teaching Standards. In addition, he serves or has served as a consultant to Nobel Education Dynamics, Connecticut College's Mellon Project, Miami of Ohio's Project Dragonfly, the New Standards Project at the University of Wyoming/Wyoming Department of Education, the South Carolina Department of Public

## BRIEF BIOGRAPHICAL SKETCH

Instruction, the Learning Technology Center at Vanderbilt University, the Joint Council on Economic Education, and the American Psychological Association.

## BRIEF BIOGRAPHICAL SKETCH

### ALICIA GRANDEY

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### Brief Biographical Sketch:

Dr. Alicia A. Grandey has been an assistant professor in industrial-organizational psychology at Penn State University since 1999, after earning her Ph.D. at Colorado State University. Her research focuses on employee emotions and stress, and how these impact the well-being of the employee and the organization. Recent and current projects assess the role of organizational demands and hostile customers, in conjunction with national culture, race, occupation, and personality, in predicting emotional labor and burnout in service work. She is particularly interested in identifying effective methods of emotion regulation in work settings, and developing training and policies that could be applied to customer service. Dr. Grandey's research has been published in *Journal of Organizational Health Psychology*, *Academy of Management Journal*, *Journal of Vocational Behavior*, *Motivation and Emotion*, *Journal of Service Research*, and *Journal of Business and Psychology*, as well as a chapter in the Industrial-Organizational Frontiers series, *Emotions in the Workplace*, and in *Justice in the Workplace* (vol. 2). Dr. Grandey's work on the topic of emotional labor has been heard during *Morning Edition* on *National Public Radio*, seen in *Ms. Magazine* and in U.S. and international newspaper columns; she is also a consultant on several major grants on emotional labor. Dr. Grandey is a member of the American Psychological Association, Society of Industrial and Organizational psychologists (Div. 14), and Academy of Management.

### Selected Publications:

- Grandey, A. (2003). When 'the show must go on': Surface and deep acting as determinants of emotional exhaustion and peer-rated service delivery. *Academy of Management Journal*, 46(1), 86-96.
- Grandey, A., & Brauburger, A. (2002). The Emotion regulation behind the customer service smile. In R. Lord, R. Klimoski, & R. Kanfer (Eds.), *Emotions in the Workplace: Understanding the Structure and Role of Emotions in Organizational Behavior*. San Francisco, CA: Jossey-Bass.

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- Grandey, A., Tam, A. & Brauburger, A. (2002). Affective states and traits of young workers:  
A diary study. *Motivation and Emotion (Special Issue)*, 26(1), 31-55.
- Brotheridge, C., & Grandey, A. (2002). Emotional labor and burnout: Comparing two perspectives on 'people work'. *Journal of Vocational Behavior*, 60, 17-39.
- Grandey, A. (2000). Emotion regulation in the workplace: A new way to conceptualize emotional labor. *Journal of Occupational Health Psychology*, 5(1), 95-110.
- Cropanzano, R., Weiss, H.M., Suckow, K., Grandey, A. (2000). Doing justice to workplace emotion. In N. Ashkanasy, Härtel, C., & Zerbe, W. (Eds.), *Emotions in the Workplace: Research, Theory, and Practice*. Westport, CT: Quorum Books.
- Grandey, A., Mattila, A., Fisk, G., & Sideman, L. (resubmitted September 15, 2003) *Is that smile for real? Authenticity of positive displays in service encounters*.
- Grandey, A., Dickter, D., & Sin, H-P. (resubmitted July 27, 2003). *The customer is not always right: Customer aggression and emotion regulation in service*.

## BRIEF BIOGRAPHICAL SKETCH

### **KARL HEIDER**

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### **Brief Biographical Sketch:**

**Karl G. Heider** is a cultural anthropologist (sub-category psychological anthropologist) who began in archaeology, worked his way through studies of material culture and sexuality and has been focussed on emotion in recent decades. He has done fieldwork in South Dakota, Arizona, Thailand, France, West New Guinea, and Sumatra. He has collaborated extensively with psychologists (Eleanor Rosch in New Guinea, Paul Ekman and Robert Levenson in Sumatra). He has also been active in visual anthropology - ethnographic films, feature films, and the use of video in research. He is currently Carolina Distinguished Professor of Anthropology at the University of South Carolina.

### **Selected Publications:**

- 1970      The Dugum Dani. A Papuan Culture in the Highlands of West New Guinea. Chicago: Aldine.
- 1975      Societal Intensification and Cultural Stress as Determining Factors in the Innovation and Conservatism of Two Dani Cultures. *Oceania*, 46(1), 53-67.
- 1976      Ethnographic Film. Austin: University of Texas Press.
- 1976      Dani Sexuality. A Low Energy System. *MAN* 12.1:188-201.
- 1987      Ekman, Friesen, O'Sullivan, Chan, Diacoyanni-Tariatzis, Heider, Krause, LeCompte, Pitcairn, Ricci-Bitti, Scherer, Tomita, and Tzavaras. Universals and Cultural Differences in the Judgments of Facial Expressions of Emotion. *Journal of Personality and Social Psychology*, 53(4), 712-717.

## BRIEF BIOGRAPHICAL SKETCH

- 1988 Ekman and Heider. The Universality of a Contempt Expression. A Replication. *Motivation and Emotion* 12(3), 3303-3308.
- 1991 Indonesian Cinema: National Culture on Screen. Honolulu: University of Hawaii Press.
- 1991 Landscapes of Emotion. Mapping Three Cultures of Emotion in Indonesia. New York: Cambridge University Press.
- 1992 Levenson, Ekman, Heider, and Friesen. Emotion and Autonomic System Activity in the Minangkabau of West Sumatra. *Journal of Personality and Social Psychology* 62(6), 972-988.
- 2004 Seeing Anthropology. Cultural Anthropology Through Film. Third Edition. Needham Heights, MA: Allyn & Bacon.

## BRIEF BIOGRAPHICAL SKETCH

### **DEREK ISAACOWITZ**

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### **Brief Biographical Sketch:**

**Derek M. Isaacowitz** is an Assistant Professor in the Social/Developmental Psychology program in the Psychology department at Brandeis University. He completed his undergraduate work at Stanford University and received his Ph.D. in Psychology from the University of Pennsylvania in 2001. He joined in the Brandeis faculty that same year. His research focuses on understanding age and individual differences in emotion and emotion regulation, with a particular focus on the attentional underpinnings of these differences. A recipient of a National Science Foundation Graduate Research Fellowship, his work is currently supported by the National Institute on Aging.

### **Selected Publications:**

- Carstensen, L. L., Isaacowitz, D. M., & Charles, S. T. (1999). Taking time seriously: A theory of socioemotional selectivity. *American Psychologist*, 54, 165-181.
- Isaacowitz, D. M., Charles, S. T., & Carstensen, L. L. (2000). Emotion and cognition. In F.I.M. Craik & T. A. Salthouse (Eds.), *The Handbook of Aging and Cognition* (2<sup>nd</sup> edition, pp. 593-631). Mahwah, N.J.: Lawrence Erlbaum Associates.
- Isaacowitz, D. M., & Seligman, M. E. P. (2001). Is pessimistic explanatory style a risk factor for depressive mood among community-dwelling older adults? *Behaviour Research and Therapy*, 39, 255-272.
- Isaacowitz, D. M., & Seligman, M. E. P. (2002). Cognitive style predictors of affect change in older adults. *International Journal of Aging and Human Development*, 54, 233-253.
- Isaacowitz, D. M., & Seligman, M. E. P. (2003). Cognitive styles and psychological well-being in adulthood and old age. In M. Bornstein, L. Davidson, C. L. M. Keyes, K. Moore, & The Center for Child Well-Being (Eds.), *Well-Being: Positive development across the lifespan* (pp. 449-475). Mahwah, NJ: Lawrence Erlbaum Associates.

## BRIEF BIOGRAPHICAL SKETCH

Isaacowitz, D. M., & Smith, J. (2003). Positive and negative affect in very old age. *Journal of Gerontology: Psychological Sciences*, 58B, P143-P152.

Isaacowitz, D. M., Smith, T. B., & Carstensen, L. L. (2003). Socioemotional selectivity and mental health among trauma survivors in old age. *Ageing International*, 28, 181-199.

Isaacowitz, D. M., Vaillant, G. E., & Seligman, M. E. P. (in press). Strengths and satisfaction across the adult lifespan. *International Journal of Aging and Human Development*.

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### **Brief Biographical Sketch:**

#### Professional Qualifications:

Pilot Oil Chair of Excellence Professor and  
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#### Research Areas:

Personality, Organizational Climate, and Statistics

#### Honors & Awards:

Distinguished Career Award, Research Methods Division, Academy of Management  
President, Society of Organizational Behavior  
Chairperson, Research Methods Division, Academy of Management  
Fellow, Society of Industrial-Organizational Psychology  
Fellow, American Psychological Association, Methods Division  
Fellow, American Psychological Society  
National Research Council Research Fellow

### **Selected Publications:**

James, L. R., & Mazerolle, M.D. (2002). *Personality in work organizations: An integrative approach*. Beverly Hills: Sage.

James, L. R., McIntyre, M. D., Glisson, C. A., & Mitchell, T. R. (in press) The conditional reasoning measurement system for aggression: An overview. *Human Performance*.

## BRIEF BIOGRAPHICAL SKETCH

James, L. R., & Rentsch, J. R., (in press) J\_U\_S\_T\_I\_F\_Y To explain the reasons why: A conditional reasoning approach to understanding motivated behavior. *Personality and Organizations*. B. Schneider & B. Smith (Eds) Mahwah, NJ: Lawrence Erlbaum

Burroughs, S. M., & James, L. R. (in press) Advancing the assessment of dispositional aggressiveness via conditional reasoning. *Counterproductive workplace behavior: An integration of both actor and recipient perspectives on causes and consequences*. Washington, DC: American Psychological Association.

James, L. R. (1998). Measurement of personality via conditional reasoning. *Organizational Research Methods, 1*, 131-163. Paper received Academy of Management Research Methods Divisions 2002 Advancement of Organizational Research Methods Award (award given to best paper in previous five years).

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### W. LEWIS JOHNSON

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### Brief Biographical Sketch:

Dr. Johnson is the Director of the Center for Advanced Research in Technology for Education at USC / Information Sciences Institute. His interests center on the use of artificial intelligence and human-computer interaction in education and lifelong learning. He leads several projects in this area.

- The Tactile Language Project is developing tools to train people quickly in foreign languages and cultures, so that they can quickly learn foreign languages and cultures, so that they employ their language and culture skills in performing specific tasks.
- The Social Intelligence Project is developing "social intelligence" capabilities for pedagogical agents, i.e., to enable them to determine when and how to interact with learners.
- The Electronic Learning project is developing technologies for developing and delivering on-line higher education courses, in collaboration with the USC Distance Education Network.
- The Automated Distance Education (ADE) project is developing a Web-based pedagogical agent named Adele that provides instruction in the context of case-based learning modules.
- Microsoft Assessment Project is developing automated tools for collecting data from learner interaction with on-line learning environments, and enabling instructors to analyze them remotely. These work is sponsored by Microsoft Research.
- The Expressive Speech Project is developing new speech synthesis techniques aimed at conveying emotion and attitudes, for use in pedagogical agents. This work is being done in collaboration with the Institute for Creative Technologies.
- The Carmen's Bright IDEAS project is developing interactive drama-based interventions aimed at training mothers of pediatric cancer patients to develop problem solving skills. This project is being conducted in collaboration with a consortium of clinical cancer centers.

He is also co-principal investigator in the following projects:

## BRIEF BIOGRAPHICAL SKETCH

- The Steve project is developing an autonomous pedagogical agent named Steve that provides training in virtual environments, both in individual and team settings. Development of Steve is continuing in collaboration with the Institute for Creative Technologies.
- The Virtual Factory Teaching System project is developing a collaborative simulation environment for learning factory management methods, guided by pedagogical agents.

### Biography

Dr. Johnson is a Senior Project Leader at USC/Information Science Institute and Research Associate Professor of Computer Science at the University of Southern California (USC). Lewis Johnson received his A. B. degree in Linguistics in 1978 from Princeton University, and his Ph.D. degrees in Computer Science from Yale University in 1985. He is secretary and past president of the Artificial Intelligence in Education Society, associate editor of the journal *Automated Autonomous Agents and Multi-Agent Systems*, was program co-chair First *International Joint Conference on Autonomous Agents and Multi-Agent Systems*, and program co-chair of the 2003 Intelligent User Interfaces conference.

When not working with computers, Lewis sings professionally in concert and on stage. He is a member of the American Guild of Musical Artists and the American Federation of Television and Radio Artists. His wife Kim and he produce and sell 100% Kona Coffee on their coffee farm in Hawaii.

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### **Brief Biographical Sketch:**

**Ruth Kanfer** is currently a Professor of Psychology in the School of Psychology at Georgia Institute of Technology, in Atlanta, Georgia, U.S.A. She received her Ph.D. (1981) from Arizona State University, was a Postdoctoral Fellow and Visiting Professor at the University of Illinois from 1981-1984, and served on the psychology and industrial relations faculty at the University of Minnesota from 1984 to 1997. Her research examines motivation, emotion, and self-regulation processes in adult skill training, job search, and job performance. Her work has been supported by the National Science Foundation, the Air Force Office of Scientific Research, and the Office of Naval Research. She is author of over 60 publications and 2 edited books, and has served on the editorial boards of scientific journals in industrial/organizational, applied experimental, and social psychology. She is a Fellow of the American Psychological Association, a Charter Fellow of the American Psychological Society, and a Fellow of the Society of Industrial and Organizational Psychology. She is the recipient of the American Psychological Association's Distinguished Scientific Award for an Early Career Contribution, and the Academy of Management's Outstanding Publication in Organizational Behavior Award.

### **Selected Publications:**

Kanfer, R., and Kantrowitz, T. M. (2002). Emotion regulation: Command and control of emotions in work life. In R. Lord, R. Klimoski, & R. Kanfer (Eds.), *Emotions in The Workplace: Understanding the Structure and Role of Emotions in Organizational Behavior* (PP. 443-472). San Francisco, CA: Jossey- Bass.

Kanfer, R., & Kantrowitz, T. M. (2002). Ability and non-ability predictors of performance. In S. Sonnentag (Ed.), *Psychological Management of Individual Performance: A Handbook in the Psychology of Management in Organizations* (pp. 27-50). England: John Wiley & Sons, Ltd.

## BRIEF BIOGRAPHICAL SKETCH

- Kanfer, R., Wanberg, C., & Kantrowitz, T. M. (2001). Job search and employment: A personality-motivational analysis and meta-analytic review. *Journal of Applied Psychology*, 86, 837- 855.
- Kanfer, R., & Ackerman, P. L. (2000). Individual differences in work motivation: Further explorations of a trait framework. *Applied Psychology: An International Review*, 49, 470-482.
- Kanfer, R., & McCombs, B. L. (2000). Motivation: Applying current theory to critical issues in training. In S. Tobias & J. D. Fletcher (Eds.), *Training and retraining: A handbook for business, government, and the military* (pp. 85-108). New York: Macmillan.
- Kanfer, R. & Heggstad, E. (1997). Motivational traits and skills: A person-centered approach to work motivation. In L. L. Cummings and B. M. Staw (Eds.), *Research in Organizational Behavior* (Vol. 19, pp. 1-57). Greenwich, CT: JAI Press.

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### **Brief Biographical Sketch:**

**Patrick Kyllonen** is the Director of the Center for New Constructs in Educational Testing Service's Research and Development Division, in Princeton, NJ, where he has been since 1999. He received his B.A. from St. John's University and Ph.D. in 1984 from Stanford University. Before joining ETS, Dr. Kyllonen held positions at the University of Georgia and the Air Force Research Laboratory in San Antonio, Texas. He is a Fellow of the American Psychological Association, and a recipient of the 2002 ETS Scientist Award, American Psychological Association Division 15 Outstanding Early Contribution Award, the Air Force Science and Technology Achievement Award, and the Technical Cooperation Program (TTCP) Achievement Award, for design, development, and implementation of the Trait-Self Description Personality Inventory across five TTCP nations. He has served on the editorial boards of the journals *Intelligence* and *Human Factors*, and has authored over 60 books, articles, and book chapters.

### **Selected Publications:**

Kyllonen, P. C. & Irvine, S. H. (2002). *Item Generation for Test Development*. Mahway, NJ: Lawrence Erlbaum Associates.

Kyllonen, P. C. (in press). Varying Perspectives on Mental Differences. A review of Ian J. Deary's, "Looking Down on Human Intelligence: From Psychometrics to the Brain." *Contemporary Psychology: APA Review of Books*, 48.

Kyllonen, P. C. & Chaiken, S. (2003). Dynamic Spatial Ability and Psychomotor Performance. *International Journal of Testing*, 3, 233-249.

Kyllonen, P. C. & Lajoie, S. (2003). Reassessing aptitude: Introduction to a special issue in honor of Richard E. Snow. In S. Lajoie & P. C. Kyllonen (Eds.), *Honoring Richard E. Snow's contributions to theories of individual differences, instruction, and assessment* [Special issue]. *Educational Psychologist*, 38(2), 79-83.

## BRIEF BIOGRAPHICAL SKETCH

- Kyllonen, P.C. (2003). Broadening the job search: Jobs outside of academia. In J. M. Darley, M. P. Zanna & H. L. Roediger (Eds.), *The Compleat Academic: A Career Guide*. (2nd ed.). (pp. 57-76). Washington, DC: American Psychological Association.
- Kyllonen, P. C., Walters, A., & Kaufman, J. (forthcoming). *Non-Cognitive Constructs in Graduate Education*. GRE Report 00-11. Princeton, NJ: Educational Testing Service.
- Kyllonen, P. C., & Irvine, S. H.. (forthcoming). *A Second Generation of Items for Test Development*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Kyllonen, P. C., Roberts, R. D., & Stankov, L. (forthcoming). *Extending Intelligence: Enhancement and New Constructs*. Mahwah, NJ: Lawrence Erlbaum Associates.

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### **KURT M. LANDGRAF**

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### **Brief Biographical Sketch:**

Kurt M. Landgraf joined Educational Testing Service as president and chief executive officer on August 7, 2000. He is Chairman of Capstar, LLC.

Formerly, he was chairman and chief executive officer of the DuPont Pharmaceuticals Company. He was also chairman of the DuPont Pharmaceuticals Advisory Board, and had responsibility for leading and implementing DuPont's pharmaceuticals strategy.

Landgraf previously was executive vice president and chief operating officer of DuPont and chairman of DuPont Europe. He also had responsibility for DuPont's consumer health presence in electronic commerce through its venture with WebMD. Prior to that, he was president and chief executive officer of the DuPont Merck Pharmaceutical Company (DMPC) and formerly served as DMPC executive vice president with worldwide responsibility for all domestic and international sales and marketing, manufacturing, medical marketing, QC/QA, and multi-source business operations.

Landgraf joined DuPont in 1980 and held numerous positions in the pharmaceuticals division. From 1980 to 1983, he was manager, worldwide marketing services; from 1983 to 1985, he was marketing director, pharmaceuticals, for Europe, Middle East, and Africa, based in Frankfurt, Germany. From 1985 to 1986, Landgraf was director, pharmaceuticals, for Europe, Middle East and Africa, also based in Frankfurt.

Landgraf returned to the United States in 1986 and was appointed planning manager, Corporate Plans Department, Wilmington, Delaware. In 1987, he returned to the pharmaceuticals division as director, business development and international division. In 1988, he was appointed director, pharmaceuticals division, and in 1989 became director of the pharmaceuticals and imaging agents divisions. Following five years at DuPont Merck, he became chief financial officer of DuPont in December 1996. Landgraf was named executive vice president on September 1, 1997, and named chief operating officer effective May 1, 1999.

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Prior to joining DuPont, Landgraf was with The Upjohn Company from 1974 to 1980. He held various positions during his career at Upjohn, having responsibility for domestic and international economic analysis, worldwide markets and product research, licensing and acquisition, financial analysis, and health economics planning.

Landgraf was associate director, marketing, for Educational Testing Service in Princeton, New Jersey from 1970 to 1974. Prior to that he was a sales representative and brand manager for Johnson & Johnson, Inc., New Brunswick, New Jersey, and a mergers and acquisitions intern for Kidder Peabody, Inc., in New York City.

Landgraf has been an instructor in economics, sociology, and labor relations in various colleges throughout the United States.

He is a member of the board of directors of IKON Office Solutions, Inc., aaiPharma, NDC

He is previous chairman of the National Pharmaceutical Council, United Way of Delaware, and the Delaware Association for Rights of Citizens with Mental Retardation. He recently completed a term as President of The GEM Consortium (National Consortium for Graduate Degrees for Minorities In Engineering and Sciences, Inc.). He is chairman of the board of the Delaware Public Policy Institute, chairman of the board of the Delaware CarePlan, and a member of the boards of the Delaware Biotechnology Institute, United Way of Mercer County, the University of Delaware Research Foundation, the Christiana Care Health System, Inc., and the Wilmington Grand Opera House. He is vice chairman of the Delaware Business/Public Education Council and of the Manufacturing Association of the Delaware State Chamber of Commerce. He serves on the Board of Trustees of Goldey-Beacom College, Wagner College, and the Advisory Committee of The Science Alliance. He is a member of the Rock Institute of Ethics, Pennsylvania State University.

Landgraf was born on October 12, 1946. He received his bachelor's degree in economics business administration from Wagner College. He also earned three master's degrees: in economics from Pennsylvania State University, in administration from Rutgers University, and in sociology from Western Michigan University. He is a graduate of the Harvard Business School Advanced Management Program.

Educational Testing Service is the world's largest private educational testing and measurement organization and a leader in educational research. A nonprofit company dedicated to serving the needs of individuals, educational institutions and agencies, and governmental bodies in 181 countries, ETS develops and annually administers more than 11 million tests worldwide on behalf of clients in education, government and business. For more information, access the ETS Web site at [www.ets.org](http://www.ets.org)

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### Brief Biographical Sketch:

**Richard D. Lane** is Professor of Psychiatry, Psychology and Neuroscience and Associate Director of the General Clinical Research Center at the University of Arizona. He received his B.A. in Psychology from Yale University, his M.D. from the University of Illinois and did his psychiatric residency and a research fellowship at Yale University School of Medicine. His clinical specialization is in consultation-liaison psychiatry. He received a 5-year Research Scientist Development Award from the National Institute of Mental Health (NIMH) to study how the brain is activated during emotional states in healthy volunteers. Upon completion of this 5-year grant in 1999 he received a Ph.D. in Experimental Psychology (with special emphasis in cognitive neuroscience) from the University of Arizona. He is senior editor of *Cognitive Neuroscience of Emotion* published in 2000 by Oxford University Press. Dr. Lane has been a member of the Council and is now Secretary-Treasurer of the American Psychosomatic Society. He is a member of the Editorial Board of *Psychosomatic Medicine*, the official journal of the American Psychosomatic Society. He is a member of the Executive Council of the Academy of Behavioral Medicine Research and is an elected member of the American College of Psychiatrists.

Dr. Lane's core academic interest is in understanding the mechanisms by which emotional stress affects physical disease. He works in three inter-related research areas with the goal of eventually creating bridges between them. The first area is individual differences in emotional experience and expression. He has developed the Levels of Emotional Awareness Scale and has actively pursued research in alexithymia. The second area is functional neuroanatomy of emotion and emotional experience. He has performed PET and more recently fMRI studies in this area. The third area is the neurogenic mechanisms by which emotion can trigger sudden cardiac death. The latter work has focused on a model of central-autonomic interactions and currently involves a focus on patients at genetic risk for sudden death due to the Long QT Syndrome. His research on emotion is currently funded by RO1 grants from NIMH and the National Heart, Lung and

## BRIEF BIOGRAPHICAL SKETCH

Blood Institute, in addition to funding of fMRI studies by the Fetzer Institute and the Dana Foundation.

### **Selected Publications:**

- Lane R., & Schwartz G. E. (1987). Levels of emotional awareness: a cognitive-developmental theory and its application to psychopathology. *American Journal of Psychiatry*, 144, 133-143.
- Lane R., Quinlan D., Schwartz G., Walker P., & Zeitlin S. (1990). The levels of emotional awareness scale: A cognitive-developmental measure of emotion. *Journal of Personality Assessment*, 55, 124-134.
- Lane R., & Schwartz G. (1992). Levels of emotional awareness: implications for psychotherapeutic integration. *Journal of Psychotherapy Integration*, 2, 1-18.
- Lane R., Kivley L. S., DuBois M. A., Shamasundara P., & Schwartz G. (1995). Levels of emotional awareness and the degree of right hemispheric dominance in the perception of facial emotion. *Neuropsychologia*, 33, 525-538.
- Lane R., Sechrest B., Riedel R., Weldon V., Kaszniak A., & Schwartz G. (1996). Impaired verbal and nonverbal emotion recognition in alexithymia. *Psychosomatic Medicine*, 58, 203-210.
- Lane R., Kaszniak A., Ahern G., & Schwartz G. (1997). Is alexithymia the emotional equivalent of blindsight? *Biological Psychiatry*, 42, 834-844.
- Lane R., Reiman E., Axelrod B., Yun L-S, Holmes A. H., & Schwartz G. (1998). Neural correlates of levels of emotional awareness: Evidence of an interaction between emotion and attention in the anterior cingulate cortex. *Journal of Cognitive Neuroscience*, 10, 225-235.
- Lane R., Riedel R., & Sechrest L. (1998). Sociodemographic correlates of alexithymia. *Comprehensive Psychiatry*, 39, 377-385.
- Lane R. (2000). Neural correlates of conscious emotional experience. In *Cognitive Neuroscience of Emotion* (pp. 345-370). Edited by Lane R, Nadel L, Ahern G, Allen J, Kaszniak A, Rapcsak S, & Schwartz G. New York: Oxford University Press.
- Lane R, Sechrest L, Riedel R, Shapiro D, & Kaszniak A. (2000). Pervasive emotion recognition deficit common to alexithymia and the repressive coping style. *Psychosomatic Medicine* 62, 492-501.

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- Barrett LF, Lane R, Sechrest L, & Schwartz G. (2000). Sex differences in emotional awareness. *Personality and Social Psychology Bulletin*, 26, 1027-1035.
- Lane R. (2000). Levels of Emotional Awareness: Neurological, Psychological and Social Perspectives. In *Handbook of Emotional Intelligence* (pp. 171-191). Edited by Parker J, & Bar-On R. San Francisco, Jossey Bass.
- Lane R, & Zei B. (2002). Complexity of Emotion Representations. In *The Wisdom in Feelings*. Edited by Feldman-Barrett L & Salovey, P. Guilford Press.
- Lane R, & McRae K. Neural Substrates of Conscious Emotional Experience: A Cognitive Neuroscientific Perspective. In *Consciousness, Emotional Self-Regulation and the Brain* (pp. 87-122). Ed. Beauregard M. Amsterdam, John Benjamins.
- Lane R, & Garfield D. (submitted). Becoming aware of feelings: Integration of cognitive-developmental, neuroscientific and psychoanalytic perspectives. *Neuro-Psychoanalysis*. Invited target article. Editor: Mark Solms.

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### **Biographical Sketch:**

**Peter J. Legree** is a Senior Research Psychologist at the U.S. Army Research Institute for the Behavioral and Social Sciences, Alexandria, VA. He received his B.A. degree in Psychology from McGill University, Montreal, Canada, in 1981, and his M.A. and Ph.D. degrees in Psychology from Case Western Reserve University, Cleveland, Ohio, in 1985 and 1988. He has over 20 years of experience in the development and validation of new testing, survey and training technologies. His expertise centers on the development of knowledge tests to measure cognitive aptitudes for emerging knowledge domains. He has published over 40 journal articles, technical reports and professional publications, reviews manuscripts for a number of professional journals and is on the editorial board of *Intelligence*.

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### Brief Biographical Sketch:

**Kathryn Lively** is an assistant professor of sociology at Dartmouth College. She received her Ph.D. from Vanderbilt University in 1999 and went on to complete a two year training program in Identity, Self, Role & Mental Health at Indiana University, funded by the National Institute of Mental Health . Her research interests include emotion, social psychology, work and family, and research methods.

### Selected Publications:

Lively, Kathryn J. and David R. Heise. "Sociological Realms of Emotional Experience." *American Journal of Sociology* [forthcoming].

McLeod, Jane D. and Kathryn J. Lively. (2003). "Social Structure and Personality." In John DeLamater's (Ed.) *Handbook of Social Psychology*. Kluwer-Plenum Press.

Lively, Kathryn J. (2002). "Client Contact and Emotional Labor: Upsetting the Balance and Evening the Field." *Work and Occupations* 29, 198-225.

Lively, Kathryn J. (2001). "Occupational Claims to Professionalism: The Case of Paralegals." *Symbolic Interaction*, 24, 343-366.

Lively, Kathryn J. (2000). "Reciprocal Emotion Management: Working Together to Maintain Stratification in Private Law Firms." *Work and Occupations* 27, 32-63. Reprinted in Douglas Harper and Helene Lawson's (Eds.) *The Cultural Study of Work*. Rowman & Littlefield Press [forthcoming].

Griffin, Larry, Chris Caplinger, Kathryn Lively, Nancy Malcom, Darren McDaniel and Candice Nelsen. (1997). "Comparative-Historical Research and Scientific Inference: Disfranchisement in the U.S. South as a Test Case." *Historical Methods: A Journal of Quantitative and Interdisciplinary History* 20(1) (Winter).

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### Brief Biographical Sketch:

**Gerald Matthews** (Ph.D) is Professor of Psychology at the University of Cincinnati. His research focuses on human performance, cognitive models of personality, the assessment of acute states of stress and emotion, and emotional intelligence. He has published over 150 journal articles and book chapters on these topics. He has co-authored books on *Attention and Emotion: A Clinical Perspective* (Lawrence Erlbaum, 1994), *Personality Traits* (Cambridge University Press, 1998), *Human Performance: Cognition, Stress and Individual Differences* (Psychology Press, 2000) and *Emotional Intelligence: Science and Myth* (MIT Press, 2003). His book on *Attention and Emotion* won the 1998 British Psychological Society Book Award. He is also editor of *Cognitive Science Perspectives on Personality and Emotion* (Elsevier, 1997). He has been elected Secretary-Treasurer of the International Society for the Study of Individual Differences, and Chair of the Individual Differences in Performance Technical Group of the Human Factors and Ergonomics Society. He has acted as a consultant for several organizations, including Unilever Research, Procter and Gamble and the MIT Electronics Research Lab. He is also an associate editor for *Personality and Individual Differences*, and a consulting editor for *Journal of Experimental Psychology: Applied* and *Emotion*.

### Selected Publications:

- Matthews, G., Campbell, S.E., Falconer, S., Joyner, L., Huggins, J., Gilliland, K., Grier, R., & Warm, J.S. (2002). Fundamental dimensions of subjective state in performance settings: Task engagement, distress and worry. *Emotion*, 2, 315-340.
- Matthews, G., Davies, D.R., & Lees, J.L. (1990). Arousal, extraversion, and individual differences in resource availability. *Journal of Personality and Social Psychology*, 59, 150-168.
- Matthews, G., Deary, I. J., & Whiteman, M. C. (in press). *Personality traits* (2<sup>nd</sup> ed.). Cambridge: Cambridge University Press.

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- Matthews, G., Davies, D.R., Westerman, S.J., & Stammers, R.B. (2000). *Human performance: Cognition, stress and individual differences*. London: Psychology Press.
- Matthews, G., & Desmond, P.A. (2002). Task-induced fatigue states and simulated driving performance. *Quarterly Journal of Experimental Psychology*, 55A, 659-686.
- Matthews, G., & Harley, T. A. (1996). Connectionist models of emotional distress and attentional bias. *Cognition and Emotion*, 10, 561-600.
- Matthews, G., Schwan, V. L., Campbell, S.E., Saklofske, D. H., & Mohamed, A. A. R. (2000) Personality, self-regulation and adaptation: A cognitive-social framework. In M. Boekarts, P. R. Pintrich & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 171-207). New York: Academic.
- Matthews, G., & Wells, A. (1999). The cognitive science of attention and emotion. In T. Dalgleish & M. Power (Eds.), *Handbook of cognition and emotion* (pp. 171-192). New York: Wiley.
- Matthews, G., & Zeidner, M. (2000). Emotional intelligence, adaptation to stressful encounters and health outcomes. In R. Bar-On & J.D.A. Parker (Eds.), *Handbook of emotional intelligence* (pp. 459-489). San Francisco: Jossey-Bass.
- Matthews, G., Zeidner, M., & Roberts, R. D. (2003). *Emotional intelligence: Science and myth*. Cambridge, MA: MIT Press.

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### **Brief Biographical Sketch:**

**Dr. Jack Mayer** is presently Professor of Psychology at the University of New Hampshire. He has served on the editorial boards of *Psychological Bulletin*, the *Journal of Personality and Social Psychology*, and the *Journal of Personality*, among others. Dr. Mayer was an Individual National Institute of Mental Health Postdoctoral Scholar at Stanford University. He received his Ph.D. and M.A. in psychology at Case Western Reserve University, and his B.A. from the University of Michigan. Dr. Mayer has published extensively in emotional intelligence, integrative models of personality, and the effects of personality on an individual's life.

Together with Dr. Salovey his articles in 1990 on emotional intelligence are widely credited with initiating contemporary scientific interest in the area. Since then, he has published widely in scholarly journals and books on the theory and measurement of emotional intelligence. Over the past few years, members of Mayer's laboratory have been examining how people high in emotional intelligence differ from others in their life styles and life outcomes.

A second area of Mayer's interests concerns a systems approach to personality psychology. He has a particular interest in the role of emotional intelligence in personality. His systems framework joins together a consideration of many of personality's parts, such as the self-concept, sociability, and others, along with how those parts are organized together, and how they develop over the life span.

### **Selected Publications:**

Salovey, P. & Mayer, J. D. (1990). Emotional intelligence. *Imagination, Cognition, and Personality*, 9, 185-211.

Mayer, J. D., & Salovey, P. (1993). The intelligence of emotional intelligence. *Intelligence*, 17, 433-442.

Mayer, J. D. (1998). A systems framework for the field of personality psychology. *Psychological Inquiry*, 9, 118-144.

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- Mayer, J. D., Carlsmith, K.M., & Chabot, H.F. (1998). Describing the person's external environment: Conceptualizing and measuring the Life Space. *Journal of Research in Personality*, 32, 253-296.
- Mayer, J. D. (2000). Emotion, intelligence, emotional intelligence. In J. P. Forgas (Ed.). *The handbook of affect and social cognition* (pp. 410-431). Mahwah, New Jersey: Lawrence Erlbaum & Associates.
- Mayer, J. D., Salovey, P., & Caruso, D. R. (2000). Models of emotional intelligence. In R. J. Sternberg (Ed.). *Handbook of Intelligence* (pp. 396-420). Cambridge, England: Cambridge University Press.
- Mayer, J. D., Salovey, P., Caruso, D. R., & Sitarenios, G. (2003). Measuring emotional intelligence with the MSCEIT V2.0. *Emotion*, 3, 97-105.
- Brackett, M. A., & Mayer, J. D. (2003). Convergent, discriminant, and incremental validity of competing measures of emotional intelligence. *Personality and Social Psychology Bulletin*, 29, 1147-1158.
- Mayer, J. D. (in press). Structural divisions of personality and the classification of traits. *Review of General Psychology*.
- Mayer, J. D. (in press). A classification system for the data of personality psychology and adjoining fields. *Review of General Psychology*.

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### MAUREEN O'SULLIVAN

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### Brief Biographical Sketch:

**Maureen O'Sullivan**, University of San Francisco, has been interested in questions related to emotional/social intelligence since she was 11 years old. Her dissertation at USC was a factor analytic investigation of Guilford's "behavioral intelligence" model. That work produced several social intelligence tests that are still being used. She has worked with Paul Ekman at UCSF for many years, examining individual differences in the ability to recognize facial expressions of emotion and to discriminate when others are lying or telling the truth.

In the last ten years, she has studied the role of humor, emotion and intelligence in measures of emotional intelligence. She has also been interested in the role of cognitive heuristics in undermining the ability to detect deception. More recently, she and Ekman have been studying a small group of highly emotionally intelligent people who obtained very high scores on several lie detection tasks. This small group was culled from a sample of more than 12,000 professionals.

Her earlier work on emotional intelligence focused on the reliability and construct validity of various measures. Her more recent efforts have been in trying to understand the processes involved in being emotionally intelligent and studying emotional intelligence from the vantage point of individuals who are undeniably emotionally intelligent.

### Selected Publications:

O'Sullivan, M., Ekman, P., & Carney, D. (in preparation). Facial expression recognition and emotional intelligence. In Geher, G (Ed.). *Advances in emotional intelligence*.

O'Sullivan, M. & Ekman, P. (in press). The Wizards of Deception Detection. In Granhag, P. A. & Stromwell, L. (Eds.) *Detecting deception*. Cambridge, UK: Cambridge University Press.

## BRIEF BIOGRAPHICAL SKETCH

- O'Sullivan, M. (in press). Emotional intelligence and detecting deception. Why most people can't "read" others, but a few can. In Riggio, R. and Feldman, R. (Eds.) *Applications of nonverbal communication*. Mahway, NJ: Erlbaum.
- O'Sullivan, M. (2003). The fundamental attribution error in detecting deceit: The boy-who-cried-wolf effect. *Personality and Social Psychology Bulletin*. October.
- Ekman, P., O'Sullivan, M. & Frank, M. (1999). A few can catch a liar. *Psychological Science*, 10(3), 263-265.
- Ekman, P., & O'Sullivan, M. (1991). Who can catch a liar? *American Psychologist*, 46(9), 913-920.
- O'Sullivan, M., Ekman, P., & Friesen, W. V. (1988). The effect of comparisons on detecting deceit. *Journal of Nonverbal Behavior*, 12(3), 203-215.
- O'Sullivan, M., Scherer, K., Ekman, P. & Friesen, W. (1985). What you say and how you say it: the contribution of speech content and voice quality to judgments of others. *Journal of Personality and Social Psychology*, 48(1), 54-62.
- O'Sullivan, M. (1983). Measuring individual differences. In J. Wiemann & R. Harrison, (Eds.), *Nonverbal Interaction* (pp.243-270). Beverly Hill, CA: Sage.
- O'Sullivan, M. (1982). Measuring the ability to recognize facial expressions of emotion. In P. Ekman (Ed.), *Emotion in the Human Face* (2nd ed.). New York: Cambridge University Press.
- Ekman, P., Friesen, W., O'Sullivan, M. & Scherer, K. (1980). Relative importance of face, body and speech in judgments of personality and affect. *Journal of Personality and Social Psychology*, 38(2), 270-277.
- O'Sullivan, M. & Guilford, J. P. (1975). Six factors of behavioral cognition: Understanding other people. *Journal of Educational Measurement*, 12(4), 255-271.
- O'Sullivan, M. & Guilford, J. P. (1976). *A Manual for Four Behavioral-Cognition Tests*. Orange, CA: Sheridan Psychological Services, Inc and Consulting Psychologists Press.
- O'Sullivan, M. & Guilford, J. P. (1972). *A Manual for Six Social Intelligence Tests*. Beverly Hills: Sheridan Psychological Services, Inc.

## BRIEF BIOGRAPHICAL SKETCH

Hoepfner, J. S. & O'Sullivan, M. (1968). Social intelligence and IQ. *Educational and Psychological Measurement*, 28, 339-344.

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### **ROSALIND PICARD**

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### **Brief Biographical Sketch:**

#### Professional Preparation:

Bachelor of Electrical Engineering; Georgia Institute of Technology; Department of  
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Certificate in Computer Engineering; Georgia Institute of Technology; Department of  
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S.M., Electrical Engineering and Computer Science; MIT; Dept. of Electrical  
Engineering and Computer Science; 1986  
Sc.D., Electrical Engineering and Computer Science; MIT; Dept. of Electrical  
Engineering and Computer Science; 1991

#### Appointments:

Associate Professor of Media Technology (with tenure)	7/98 - present
Associate Professor of Media Technology	7/95 - 7/98
NEC Career Development Professor of Computers and Communications	7/92 - 7/98
Assistant Professor of Media Technology	7/91 - 7/92
AT&T Bell labs, Member of the Technical Staff	6/84 - 3/87

#### Synergistic Activities:

1. Regular speaker at university symposia, international conference keynotes and panels, etc.
2. Co-developer of databases for image analysis (Vistex) and affect analysis, available to researchers around the world (via physionet and advertised in our online publications).

## BRIEF BIOGRAPHICAL SKETCH

3. Service on editorial, advisory, and review boards (Including IEEE Transactions PAMI, ACM User Modeling, Georgia Tech College of Computing, NSF CISE Advisory Board)
4. Founded new graduate courses at MIT, which are a part of the OpenCourseWare initiative
5. Co-director, Things That Think multi-company sponsor consortium at MIT

### Collaborators & Other Affiliations:

Steve Buckley, Justine Cassell, Graham Cosier, Frank Dabek, Jack Dennerlein, Art Graesser, Barry Kort, Jeffrey Levine, Betty Lou McClanahan, Youngme Moon, Jack Mostow, Joe Paradiso, Joe Pompei, Rob Reilly, Bradley Rhodes, Justin Seger, and Thad Starner

### **Selected Publications:**

1. R.W. Picard (2003). "Affective Computing: Challenges," *Int. J. of Human-Computer Studies*, 59, pp 55-64.
2. R. Fernandez and R.W. Picard (2003). "Modeling Drivers Speech Under Stress," *Speech Communication*, Vol. 40, 145-159.
3. J. Klein, Y. Moon and R.W. Picard (2002). "This Computer Responds to User Frustration: Theory, Design, Results, and Implications," *Interacting with Computers*. Vol. 14, No. 2, pp 69 – 83.
4. Kapoor, A. & Picard, R. (2002). Real-time, fully automatic upper facial feature tracking. In *Proc. of the 5<sup>th</sup> Int. Conf. on Automatic Face and Gesture Recognition 2002*, Washington D.C., May.
5. Yuan Qi and Rosalind W. Picard (2002). "Context-sensitive Bayesian Classifiers and Application to Mouse Pressure Pattern Classification," *Proc. of the Int.l Conf. on Pattern Recognition*, Quebec City, Canada, August.
6. Kapoor, S. Mota and R. W. Picard (2001). "Towards a Learning Companion that Recognizes Affect" *Proceedings from Emotional and Intelligent II: The Tangled Knot of Social Cognition*, AAAI Fall Symposium, November.
7. Kort, R. Reilly, and R. W. Picard (2001). "An Affective Model of Interplay Between Emotions and Learning: Reengineering Educational Pedagogy--Building a Learning Companion," *Proceedings from the International Conference on Advanced Learning Technologies (ICALT 2001)*, pp. 43 – 48. (Best paper prize award.)

## BRIEF BIOGRAPHICAL SKETCH

8. R. W. Picard, E. Vyzas, and J. Healey (2001). "Toward Machine Emotional Intelligence: Analysis of Affective Physiological State," *IEEE Transactions Pattern Analysis and Machine Intelligence*, Volume 23, No. 10, October, pp. 1175-1191.
9. T. P. Minka and R. W. Picard (1997). "Interactive learning using a 'society of models'" *Pattern Recognition* 30(4), 1997, pp. 565-581. (Best paper prize award.)
10. R.W. Picard (1997). *Affective Computing*, MIT Press.

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### Brief Biographical Sketch

William Revelle received his Ph.D. from the University of Michigan in 1973 and has been at Northwestern University since 1973. He is director of the personality program at Northwestern where he was department chairman for 9 years. He is a former president of the Society of Multivariate Experimental Psychology, a Fellow of the American Association for the Advancement of Science and of the American Psychological Society and serves on the board of the Federation of American Scientists. He is the president elect of the International Society for the Study of Individual Differences. Revelle's research on personality and individual differences reflects his belief that the study of personality needs to ask the fundamentally hard questions of psychology. He sees personality and individual differences as the last refuge of the generalist in psychology; to study personality one must integrate findings from biological, cognitive, and social psychology. His publications range from empirical demonstrations of the interactions of stable personality traits and situational demands to theoretical analyses of the dynamics of action and the interrelationship of personality, motivation, and cognitive performance, to criteria for the number of factors as well as broad reviews of the field. Revelle's recent work has been examining the "tides of emotion" as a link between stable between individual traits and within individual emotional and cognitive variability. Tracking moment to moment fluctuations in affect across time allows for modeling the stability and dynamics of affect, behavior and cognition that we call personality. He is also collaborating with cognitive and computer scientists in developing theoretical models of how personality needs to be implemented for effective functioning in autonomous agents. Feeling that it is important to inform the broader community of the importance of individual differences in intelligence and personality, Revelle started the "Personality Project" on the web at <http://personality-project.org> as a way for academic psychologists to share their findings with each other and with the public at large.

## BRIEF BIOGRAPHICAL SKETCH

### Selected Publications

- Ortony, A., Norman, D.A. & Revelle, W. (in press): Effective Functioning: A Three Level Model of Affect, Motivation, Cognition, and Behavior. To appear in J. M. Fellous & M. A. Arbib (Eds.), *Who Needs Emotions? The Brain Meets the Machine*. New York: Oxford University Press.
- Acton, G. S. , & Revelle, W. (2002). Interpersonal personality measures show circumplex structure based on new psychometric criteria. *Journal of Personality Assessment*, 79, 456-481.
- Baehr, E. K., Revelle, W., & Eastman, C. I. (2000). Individual differences in the phase and amplitude of the human circadian temperature rhythm: with an emphasis on morningness-eveningness. *The Journal of Sleep Research*, 9, 117-127
- Rafaeli-Mor, E.; Gotlib, I. A. .; Revelle, W. (1999). The meaning and measurement of self complexity. *Personality and Individual Differences*. 27 341-356
- Gilboa-Schechtman, E., Revelle, W., & Gotlib, I. H.. (2000). Stroop interference following mood induction: Emotionality, mood congruence, concern relevance, and persistence. *Cognitive Therapy and Research*, 24 (5),491-503.
- Rogers, G. and Revelle, W. (1998) Personality, mood, and the evaluation of affective and neutral word pairs. *Journal of Personality and Social Psychology*, 74, 1592-1605.
- Revelle, W. (1995). Personality Processes. *Annual Review of Psychology*, 46, 295-328.
- Revelle, W. (1993). Individual differences in personality and motivation: 'Non-cognitive' determinants of cognitive performance. In A. Baddeley & L. Weiskrantz (Eds.), *Attention: Selection, awareness and control: A tribute to Donald Broadbent* (pp. 346-373). Oxford: Oxford University Press.
- Revelle, W. (1989) Personality, Motivation, and Cognitive Performance. P. Ackerman, R., and R. Cudeck (Eds.): *Learning and Individual Differences: Abilities, Motivation, and Methodology*. Erlbaum. (pp. 297-341).
- Humphreys, M.S., & Revelle, W. (1984). Personality, motivation, and performance: a theory of the relationship between individual differences and information processing. *Psychological Review*, 91, 153-184.

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### **Brief Biographical Sketch:**

**Richard D. Roberts** (PhD) is a Senior Research Scientist in the Center for New Constructs at ETS, Princeton, New Jersey, and an Honorary Senior Lecturer in the School of Psychology, University of Sydney, Australia. His area of specialization is individual differences, and he has conducted research and published on the topics of human cognitive abilities, emotional intelligence, self-confidence, sensory processes, aging, processing speed, and human chronotype (“morningness” and “eveningness”). He has published nearly fifty articles in peer review journals, contributed a number of invited book chapters, and along with Philip Ackerman and Pat Kyllonen, edited the APA Publication, “*Learning and Individual Differences: Content, Trait and Process Determinants*”. His most recent book, “*Emotional Intelligence: Science and Myth*,” coauthored with Moshe Zeidner and Gerald Matthews, published by MIT Press earlier this year, received an honorable mention in the “The Outstanding Professional and Scholarly Titles of 2002” by the Association of American Publishers. Next year, Dr. Roberts will chair the Fourth Spearman Seminar. He is the proud ‘owner’ of an eighteen year old son, Matthew.

### **Selected Publications:**

Zeidner, M., Matthews, G., Roberts, R. D., & MacCann, C. (2003). Development of emotional intelligence: Towards a multi-level investment model. *Human Development*, 46, 69-96.

Matthews, G., Zeidner, M., & Roberts, R. D. (2003). *Emotional Intelligence: Science and Myth*. Boston, MA: MIT Press.

Bowman, D., Markham, P. M., & Roberts, R. D. (2002). Expanding the frontier of human cognitive abilities: So much more than (plain) g! *Learning and Individual Differences*, 13, 127-158.

## BRIEF BIOGRAPHICAL SKETCH

- Zeidner, M., Roberts, R. D., & Matthews, G. (2002). Can emotional intelligence be schooled? A critical review. *Educational Psychologist*, 37, 215-231.
- Roberts, R. D., Zeidner, M., & Matthews, G. (2001). Does emotional intelligence meet traditional standards for an 'intelligence'? Some new data and conclusions. *Emotion*, 1, 196-231.
- Roberts, R. D., Goff, G. N., Anjou, F., Kyllonen, P. C., Pallier, G., & Stankov, L. (2000). The Armed Services Vocational Aptitude Battery: Not much more than acculturated learning (Gc)!? *Learning and Individual Differences*, 12, 81-103.
- Roberts, R. D., & Kyllonen, P. C. (1999). Morningness-eveningness and intelligence: Early to bed, early to rise will likely make you anything but wise. *Personality and Individual Differences*, 27, 1123-1133.
- Roberts, R. D., Pallier, G., & Goff, G. N. (1999). Sensory processes within the structure of human cognitive abilities. In P. L. Ackerman, P. C. Kyllonen, & R. D. Roberts (Eds.), *Learning and Individual Differences: Process, Trait, and Content Determinants*. (pp. 339 - 370). Washington, DC: American Psychological Association.
- Roberts, R. D., & Stankov, L. (1999). Individual differences in speed of mental processing and human cognitive abilities: Towards a taxonomic model. *Learning and Individual Differences*, 11, 1-120.
- Davies, M., Stankov, L., & Roberts, R. D. (1998). Emotional Intelligence: In search of an elusive construct. *Journal of Personality and Social Psychology*, 75, 989-1015.

## BRIEF BIOGRAPHICAL SKETCH

### **FABIO SALA**

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### **Brief Biographical Sketch:**

**Fabio Sala** is a Senior Research Consultant at the Hay Group's, McClelland Center for Research and Innovation, in Boston. He received his Ph.D. in Social Psychology from Boston University under David C. McClelland. Fabio's client work at the McClelland Center has been with leading global organizations, such as IBM, Pfizer, AeroMexico, Caterpillar, Toyota, Health Net, and UNDP. Prior to joining the Hay Group, Fabio was an adjunct lecturer at the University of Massachusetts where he taught Organizational Behavior, Research Methods, Statistics, and Social Psychology, and Introductory Psychology courses. He also was a lecturer at Boston University and Johns Hopkins University. His research has served to identify the characteristics of outstanding performers, evaluate the effectiveness of development interventions, and evaluate the impact of assessment and intervention on workplace performance. His current research interests include the assessment and development of individual competencies/characteristics and organizational-level variables that predict various workplace processes and outcomes.

### **Selected Publications:**

Sala, F. (2003, September). Humor Pays: Witty executives get bigger bonuses and better performance ratings. *Harvard Business Review*.

Sala, F. (2004, in press). Making the Business Case: Emotional Intelligence Competencies and Important Business Outcomes. In Druskat, V., Sala, F., & Mount, G. (Eds.). *Linking Emotional Intelligence and Performance at Work: Current Research Evidence*. San Francisco: Jossey-Bass.

Druskat, V., Sala, F., & Mount, G. (Eds.) (2004, in press). *Linking Emotional Intelligence and Performance at Work: Current Research Evidence*. New York: Lawrence Erlbaum Associates.

## BRIEF BIOGRAPHICAL SKETCH

- Sala, F. (2003, in press). Executive Blind Spots: Discrepancies Between Self-Other Ratings. *Journal of Consulting Psychology: Research and Practice*.
- Sala, F. (2003, in press). Leadership in education: effective college Principals. *Nonprofit Management and Leadership*.
- Sala, F. (2002). *Emotional Competence Inventory (ECI) Technical Manual*. Boston: McClelland Center for Research and Innovation, Hay Group.
- Sala, F., & Dwight, S. (2002). Predicting executive performance with multi-rater surveys: Whom you ask makes a difference. *Journal of Consulting Psychology: Research and Practice*, 54(3), 166-172.
- Sala, F., Krupat, E., & Roter, D. (2002). Satisfaction and the use of humor by physicians and patients. *Psychology and Health: An International Journal*, 17(3), 269-280.

## BRIEF BIOGRAPHICAL SKETCH

### GERARD SAUCIER

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### Brief Biographical Sketch:

INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
University of North Carolina, Chapel Hill, NC	B.A.	1978	English
John F. Kennedy University, Orinda, CA	M.A.	1984	Clinical Psychology
University of Oregon, Eugene, OR	Ph.D.	1991	Counseling Psychology

### PROFESSIONAL EXPERIENCE AND ACADEMIC APPOINTMENTS

1986-1989	Employee Assistance Counselor, Employee Assistance Professionals, Inc., Portland, OR
1988-1990	Mental Health Therapist, Center for Community Mental Health, Portland, OR
1990-1991	Psychological Intern, University of Maine Counseling Center
1991-1993	Counselor and Assistant Professor, Eastern Illinois University
1993-1997	Assistant Professor, California State University San Bernardino
1997-2000	Assistant Professor, University of Oregon, Eugene, OR
1993-2003	Adjunct Research Scientist, Oregon Research Institute, Eugene, OR
2000-	Associate Professor, University of Oregon, Eugene, OR
2003-	Research Scientist, Oregon Research Institute, Eugene, OR

### HONORS

1999	Cattell Award for Early-Career Achievement in Multivariate Psychology, Society of Multivariate Experimental Psychology
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### EDITORIAL BOARDS

2001-2003	Associate Editor, Journal of Research in Personality
2001-	Journal of Personality
1998-	Journal of Personality and Social Psychology
1998-	Journal of Research in Personality
1994-	Personality and Social Psychology Bulletin

## BRIEF BIOGRAPHICAL SKETCH

### **Selected Publications:**

- Saucier, G. (2003). Factor structure of English-language personality type nouns. *Journal of Personality and Social Psychology*, 85, 695-708.
- Saucier, G. (2003). An alternative multi-language structure of personality attributes. *European Journal of Personality*, 17, 179-205.
- Saucier, G., & Goldberg, L. R. (2001). Lexical studies of indigenous personality factors: Premises, products, and prospects. *Journal of Personality*, 69, 847-880.
- Saucier, G., Ostendorf, F., & Peabody, D. (2001). The non-evaluative circumplex of personality adjectives. *Journal of Personality*, 69, 537-582.
- Saucier, G. (2000). Isms and the structure of social attitudes. *Journal of Personality and Social Psychology*, 78, 366-385.
- Saucier, G., & Ostendorf, F. (1999). Hierarchical subcomponents of the Big Five personality factors: A cross-language replication. *Journal of Personality and Social Psychology*, 76, 613-627.
- Saucier, G., & Goldberg, L. R. (1998). What is beyond the Big Five? *Journal of Personality*, 66, 495-524.
- Saucier, G. (1997). Effects of variable selection on the factor structure of person descriptors. *Journal of Personality and Social Psychology*, 73, 1296-1312.
- Saucier, G. (1994). Separating description and evaluation in the structure of personality attributes. *Journal of Personality and Social Psychology*, 66, 141-154.
- Saucier, G. (1992). Benchmarks: Integrating affective and interpersonal circles with the Big Five personality factors. *Journal of Personality and Social Psychology*, 62, 1025-1035.

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### **KLAUS SCHERER**

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### **Brief Biographical Sketch:**

**Klaus Scherer**, born in 1943, studied economics and social sciences at the University of Cologne and the London School of Economics. Following his postgraduate studies in psychology, he obtained a Ph.D. from Harvard University in 1970. After teaching at the University of Pennsylvania, Philadelphia, and the University of Kiel, Germany, he was appointed, in 1973, full professor of social psychology at the University of Giessen, Germany.

Since 1985, Klaus Scherer is a full professor of psychology at the University of Geneva, Switzerland, and director of the Human Assessment Centre (Laboratoire d'Evaluation Psychologique). His teaching and research activities focus on the areas of emotion, stress, motivation, personality, and organisational behavior. Several research programs, financed by granting agencies and private foundations in the USA, Germany, and Switzerland, are directed at the study of cognitive evaluations of emotion-eliciting events and on facial and vocal emotion expression. Scherer reported this work in numerous publications in the form of monographs, contributed chapters, and papers in international journals. He edited several collected volumes and handbooks and co-edits the "Affective Science Series" for Oxford University Press. He is a founding co-editor of the journal *Emotion*.

Klaus Scherer is a member of several international scientific societies and a fellow of the American Psychological Association and the Acoustical Society of America. He was an invited professor at Stanford, Berkeley, the University of Zurich, and EHESS Paris. He has been elected member of the Academia Europea and honorary foreign member of the American Academy of Arts and Sciences.

Klaus Scherer also pursues activities directed at the practical application of scientific research findings in business and public administration. He directs several long-term applied research programs in the area of organisational behavior, particularly on the emotional climate in companies and on electronic communication (Email, tele-

## BRIEF BIOGRAPHICAL SKETCH

conferencing). He is consulted by public and private organisations and lectures on topics such as emotional intelligence, management development, and personality/motivation.

### **Selected Publications:**

- Scherer, K. R. (1984). On the nature and function of emotion: A component process approach. In K. R. Scherer & P. Ekman (Eds.), *Approaches to emotion* (pp. 293-317). Hillsdale, NJ: Erlbaum.
- Scherer, K. R., Ladd, D.R., & Silverman, K. (1984). Vocal cues to speaker affect: Testing two models. *Journal of the Acoustical Society of America*, 76, 1346-1356.
- Scherer, K. R. (1986). Vocal affect expression: A review and a model for future research. *Psychological Bulletin*, 99, 143- 165.
- Scherer, K. R. (1993). Studying the emotion-antecedent appraisal process: An expert system approach. *Cognition and Emotion*, 7, 325-355.
- Scherer, K. R. (1997). The role of culture in emotion-antecedent appraisal. *Journal of Personality and Social Psychology*, 73, 902-922.
- Scherer, K. R. (2000). Emotions as episodes of subsystem synchronization driven by nonlinear appraisal processes. In M. D. Lewis & I. Granic (Eds.) *Emotion, development, and self-organization: Dynamic systems approaches to emotional development* (pp. 70-99). New York/Cambridge: Cambridge University Press.
- Scherer, K. R. & Ceschi, G. (2000). Studying affective communication in the airport: The case of lost baggage claims. *Personality and Social Psychology Bulletin*, 26(3), 327-339.
- Scherer, K. R. (2000). Psychological models of emotion. In J. Borod (Ed.). *The neuropsychology of emotion* (pp. 137-162). Oxford/New York: Oxford University Press.
- Scherer, K. R. (2001). Appraisal considered as a process of multi-level sequential checking. In K. R. Scherer, A. Schorr, & T. Johnstone (Eds.). *Appraisal processes in emotion: Theory, Methods, Research* (pp. 92-120). New York and Oxford: Oxford University Press.

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### **WILLIAM J. STRICKLAND**

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### **Brief Biographical Sketch:**

**Dr. William J. Strickland** is Vice-President and Director of HumRRO's Workforce Analysis and Training Systems Division. He has more than 30 years' experience in research and development, program and contract management, program implementation, and program evaluation. He is currently managing a five-year, \$2 million project to model turnover among enlisted personnel in the Army. This project involves designing a conceptual model of turnover, administering surveys to a 70,000-soldier cohort at multiple points in their careers, combining survey data with training, performance, and other administrative data, and building a longitudinal database to support analyses at various decision points. Dr. Strickland also provides senior-level consultation on a project to develop a decision-support system for use by Air Force personnel managers. This system will allow managers to evaluate the impacts on each Air Force occupation if entry requirements for that occupation are changed. Outputs from the system will show the effects on the demographics of people entering an occupation (e.g., race, sex, educational attainment, and aptitude) when standards are modified, as well as the effects on training grades and attrition that will result from those changes. Dr. Strickland retired from the United States Air Force as a colonel; for his last 4 years on active duty, he directed all Air Force human resources research. A Fellow of the American Psychological Association (APA), and a past-president of APA's Division of Military Psychology, Dr. Strickland was selected to represent all 50,000 APA members on three occasions while testifying before committees of the United States House and Senate. Dr. Strickland holds a Ph.D. in Industrial/Organizational Psychology from The Ohio State University.

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### MOSHE ZEIDNER

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### Brief Biographical Sketch:

**Moshe Zeidner** is Dean of Research and Professor of Educational Psychology at the University of Haifa. His Doctoral research in Educational Psychology at the Hebrew University focused on “Some Situational Determinants of Group Performance on Standardized Tests of Ability (1984)”. His main fields of interest are in the area of human emotions, personality and individual differences (with particular concern for the interface of personality and intelligence and the stress and coping process), and psychoeducational assessment. He currently serves as Associate Editor (along with Michael Eysenck) of, and is an ad-hoc reviewer for, a number of APA journals. He is also currently the Series Editor (along with Donald H. Saklofske) of the Plenum book series on Human Exceptionality and previously was Series Editor (along with Aaron Ben-Ze’ev) of a new series on Human Emotions, sponsored by the University of California Press, Berkeley. He is the author or co-editor of 7 books and author of over 120 scientific papers and chapters. He has received a number of competitive grants from the Ministry of Science and “Ford.” He is a member of APA, ISRE, ISSID, and the Israeli Psychological Association. He received the “Lifetime achievement award for outstanding contribution to stress and anxiety research” at the meeting of the Society for Stress and Anxiety Research” in July, 2003, Lisbon, Portugal. His recent book (with G. Matthews & Rick Roberts) received an award from the US Society for Academic Book Publishers for the year 2003. He is married, has two lovely boys, and in his free time enjoys swimming, walking, and reading thrillers and books on humor and jokes.

### Selected Publications:

Zeidner, M. (1998). *Test Anxiety: The state of the art*. (440 pp., illus.). New York: Plenum.

Matthews, G., Zeidner, M., & Roberts, R. D. (2002). *Emotional Intelligence: Science or Myth?* Cambridge: MIT Press. (697 pp., illus.).

## BRIEF BIOGRAPHICAL SKETCH

- Saklofske, D. & Zeidner, M. (Eds.). (1995). *International Handbook of Personality and Intelligence*. New York: Plenum (36 Chapters , 776 pages).
- Zeidner, M. & Endler, N. (Eds.). (1996). *Handbook of coping: Theory, research, applications*. New York: Wiley (25 chapters, 750 pages).
- Zeidner, M. (1987). Test of the cultural bias hypothesis: some Israeli findings. *Journal of Applied Psychology*, 72, 38-48.
- Zeidner, M., Klingman, A., & Papko, O. (1988). Enhancing students' test coping skills: Report of a psychological health education program. *Journal of Educational Psychology*, 80, 95-101.
- Zeidner, M. & Hammer, A. (1992). Coping with missile attack: Resources, strategies, and outcomes. *Journal of Personality*, 60, 709-746.
- Zeidner, M. & Schleyer, E. (1999). The big-fish-little-pond effect for academic self-concept, test anxiety, and school grades in gifted children. *Contemporary Educational Psychology*, 24, 305-329.
- Zeidner, M. & Matthews, G. (2000, 2<sup>nd</sup> Ed.). Intelligence and personality. In R.J. Sternberg (Ed.). *Handbook of intelligence* (pp. 581-610.). New York: Cambridge University Press.
- Zeidner, M., Roberts, R. D., & Matthews, G. (2002). Can emotional intelligence be schooled? A critical review. *Educational Psychologist*, 37, 215-231.

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### JOSEPH E. ZINS

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### Brief Biographical Sketch:

**Joseph E. Zins** is a psychologist and professor in the College of Education at the University of Cincinnati. He has 30 years of applied experience, including work with public school districts, a community mental health center, a pediatric hospital, and urban community agencies.

Professor Zins is recognized nationally and internationally as an expert on social competence promotion, prevention, individual and organizational consultation, and psychological service delivery systems. He has over 150 scientific publications, and included among his twelve books are *Building Academic Success on Social and Emotional Learning* (2004) and the best-selling *Promoting Social and Emotional Learning* (1997). His work has been supported by the U.S. Department of Education, U.S. Bureau of Maternal and Child Health, American Trauma Society, Ohio Board of Regents, Joseph P. Kennedy, Jr., Foundation, and the Greater Cincinnati Foundation. Dr. Zins has conducted over 130 workshops, presentations, and engaged in related organizational consultation with school districts, governmental agencies, and professional organizations throughout the U.S., as well as in Brazil, Canada, Germany, Scotland, Turkey, and the United Kingdom.

Dr. Zins is a member of the Leadership Team of the Collaborative for Academic, Social, and Emotional Learning (CASEL; [www.CASEL.org](http://www.CASEL.org)) and Consulting Editor for the *Social-Emotional Learning Book Series* (Teachers College Press). He is a Fellow of the American Psychological Association (Divisions 13, 16, 27, and 37) and has served as Editor of the multidisciplinary *Journal of Educational and Psychological Consultation*, Secretary of the National Association of School Psychologists (NASP), and in many other national and international leadership positions.

In addition to Dr. Zins' extensive professional activities, he volunteers with many charitable, non-profit, and community organizations. Among them are the National Children's Cancer Foundation, St. Vivian School Education Commission (President), Cincinnati Children's Hospital Medical Center Cancer Committee, Finneytown Athletic

## BRIEF BIOGRAPHICAL SKETCH

Association (Board of Directors and Vice-President), Winton United Soccer Club, Southern Ohio Chapter of the Leukemia and Lymphoma Society (Committee Chair), and the Urban Appalachian Council. He is married to Charlene R. Ponti, Ph.D., and is the proud father of three children.

### Selected Publications:

Zins, J.E., Weissberg, R.P., Wang, M.C., & Walberg, H.J. (Eds.).(in press). *Building academic success on social and emotional learning: What does the research say?* New York: Teachers College Press.

Zins, J.E., Elias, M.J., & Greenberg, M.T. (in press). Facilitating success in school and in life through social and emotional learning. *Perspectives in Education*, 21(4).

Elias, M. J., Zins, J. E., Weissberg, R. P., Frey, K. S., Greenberg, M. T., Haynes, N. M., Kessler, R., Schwab-Stone, M. E., & Shriver, T. P. (1997). *Promoting social and emotional learning: Guidelines for educators*. Alexandria, VA: Association for Supervision and Curriculum Development.

Zins, J. E., Travis, L. F., III, & Freppon, P. A. (1997). Linking research and educational programming to promote social and emotional learning. In P. Salovey & D. J. Sluyter (Eds.), *Emotional development and emotional intelligence: Educational implications* (pp. 257-274). New York: Basic Books.

Consortium on the School-Based Promotion of Social Competence. [Elias, M. J., Weissberg, R. P., Hawkins, J. D., Perry, C. L., Zins, J. E., Dodge, K. A., Kendall, P.C., Gottfredson, D., Rotheram-Borus, M. J., Jason, L.A., & Wilson-Brewer, R. J.]. (1994). The school-based promotion of social competence: Theory, research, practice, and policy. In R. J. Haggerty, L. Sherrod, N. Garmezy, & M. Rutter (Eds.), *Stress, risk, resilience in children and adolescents: Processes, mechanisms, and interaction* (pp. 268-316). New York: Cambridge University Press.

Greenberg, M. T., Weissberg, R. P., O'Brien, M. U., Zins, J. E., Fredericks, L., Resnik, H., & Elias, M. J. (2003). Enhancing school-based prevention and youth development through coordinated social, emotional, and academic learning. *American Psychologist*, 58(6/7), 466-474.

Elias, M. J., Zins, J. E., Graczyk, P.A., & Weissberg, R. P. (2003). Implementation, sustainability, and scaling up of social-emotional and academic innovations in public schools. *School Psychology Review*, 32, 303-319.

## BRIEF BIOGRAPHICAL SKETCH

- Graczyk, P. A., Domitrovich, C. E. & Zins, J. E. (2003). Facilitating the implementation of evidence-based prevention and mental health promotion efforts in schools. In M. D. Weist, N. Lever, & S. Evans (Eds.), *Handbook of school mental health: Advancing practice and research* (pp. 301-318). New York: Kluwer Academic.
- Zins, J. E. (2001). Examining opportunities and challenges for school-based prevention and promotion: Social and emotional learning as an exemplar. *The Journal of Primary Prevention*, 21(4), 441-446.
- Graczyk, P., Weissberg, R. P., Payton, J. W., Elias, M. J., Greenberg, M. T., & Zins, J. E. (2000). Criteria for evaluating the quality of school-based social and emotional learning programs. In R. Bar-On & J. D. A. Parker (Eds.), *The handbook of emotional intelligence* (pp. 391-410). San Francisco: Jossey-Bass.
- Zins, J. E., Elias, M. J., Greenberg, M. T., & Weissberg, R. P. (2000). Promoting social and emotional competence in children. In K. M. Minke & G. C. Bear (Eds.), *Preventing school problems - promoting school success: Strategies and programs that work* (pp. 71-100). Bethesda, MD: National Association of School Psychologists.